Regulatory and Best Practices Review

MAG Truck Parking Study

Maricopa County

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Prepared for:

MARICOPA ASSOCIATION of GOVERNMENTS

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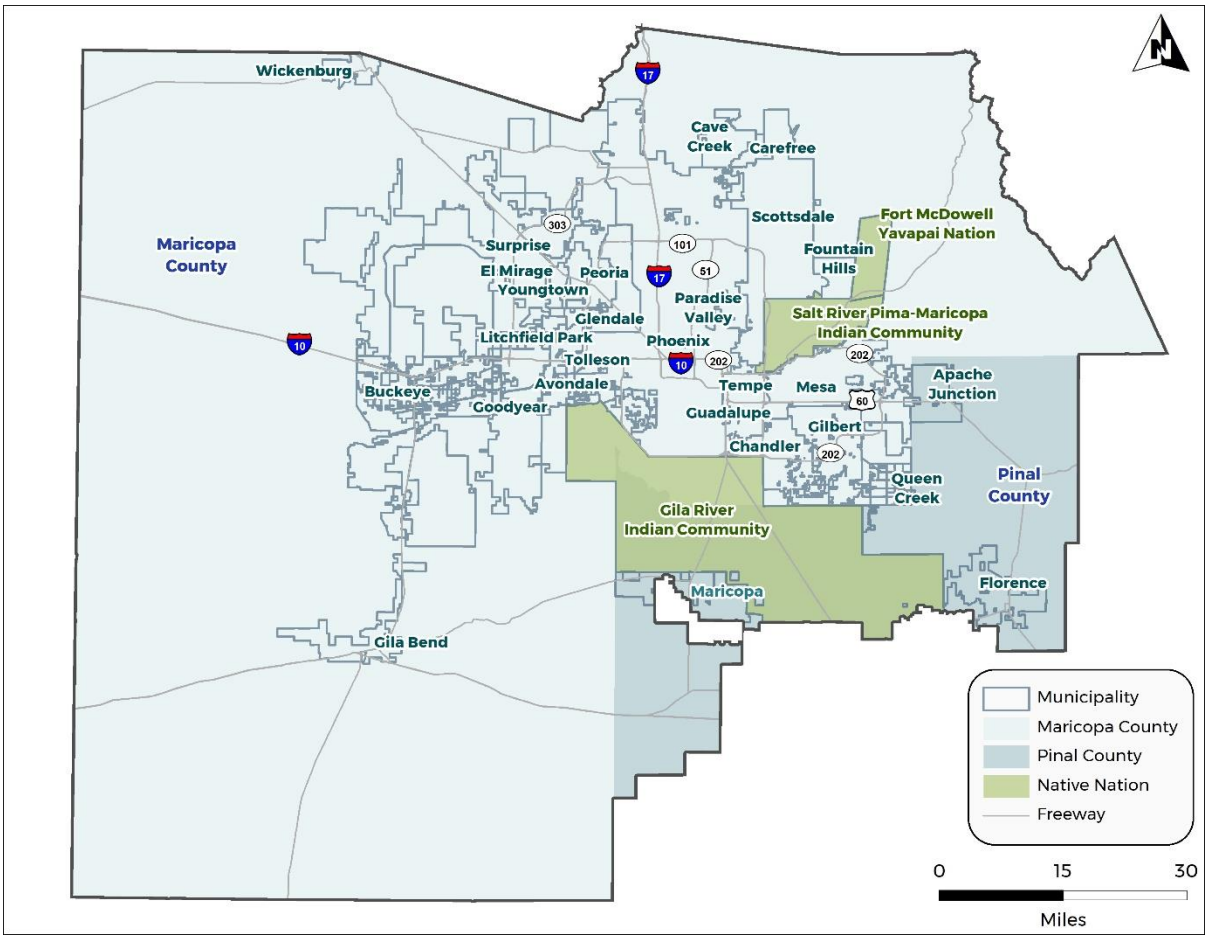
Contents

I. Introduction

The Maricopa Association of Governments (MAG) is a group of local governments that work together on issues that affect the more than four million people who live in the greater Phoenix area, referred to as the MAG region (**Figure 1**). MAG is a Metropolitan Planning Organization created by federal law to carry out transportation planning processes in urbanized areas as well as a Council of Governments serving the residents of the region across municipal and county boundaries.

MAG has initiated a study to evaluate truck parking supply and demand, with a specific emphasis on the industrial clusters in the MAG region. In 2018, the U.S. Department of Transportation mandated the use of electronic logging devices (ELD) as part of the Driver Hours of Service regulations. Since these regulations have been in effect MAG has seen the demand for truck parking significantly increase.

Figure 1: MAG Region Coverage Area



This report will summarize federal, state and local regulations regarding truck parking in the MAG region. It will also review recommendations and best practices from truck parking plans throughout the country. The report will provide a baseline understanding of the current regulatory environment and the state of practice in addressing truck parking issues. This information will be used in identification of needs and development of strategies in later tasks in this study.

II. Federal, State, and Local Regulations

1. Federal Regulations

1.1 Hours of Service Regulations

The demand for truck parking is determined by the need of drivers to take the required rest breaks to ensure the safe operation of the trucks. The Federal Motor Carrier Safety Administration established its rest requirements with the updated Hours of Service regulations, which may be summarized as:

- 11-Hour Driving Limit: May drive a maximum of 11 hours after 10 consecutive hours off duty.
- 14-Hour Limit: May not drive beyond the 14th consecutive hour after coming on duty, following 10 consecutive hours off duty. Off-duty time does not extend the 14-hour period.
- Rest Breaks: May drive only if 8 hours or less have passed since end of driver's last off-duty or sleeper berth period of at least 30 minutes. Does not apply to drivers using either of the short-haul exceptions.
- 60/70-Hour Limit: May not drive after 60/70 hours on duty in 7/8 consecutive days. A driver may restart a 7/8 consecutive day period after taking 34 or more consecutive hours off duty.
- Sleeper Berth Provision: Drivers using the sleeper berth provision must take at least 8 consecutive hours in the sleeper berth, plus a separate 2 consecutive hours either in the sleeper berth, off duty, or any combination of the two.
- 34-Hour Restart Provision: Drivers may restart a 7 or 8 consecutive day period after taking 34 or more consecutive hours of rest. FMCSA recently revised regulations to limit the use of the 34-hour restart provision to once every 168 hours and to require that anyone using the 34-hour restart provision have as part of the restart two periods that include 1 a.m. to 5 a.m. It also includes a provision that allows truckers to drive if they have had a break of at least 30 minutes, at a time of their choosing, sometime within the previous 8 hours.

Changes in HOS regulations, or how they are enforced, will likely lead to changes in the location and quantity of truck parking demanded. In Aug 2019, the FMCSA proposed changes to the HOS regulations in response to feedback from the trucking industry and other stakeholders. The proposed changes were:

- Increase safety and flexibility for the 30-minute break rule by tying the break requirement to eight hours of driving time without an interruption for at least 30 minutes and allowing the break to be satisfied by a driver using on duty, not driving status, rather than off duty.
- Modify the sleeper-berth exception to allow drivers to split their required 10 hours off duty into two periods: one period of at least seven consecutive hours in the sleeper berth and the other period of not less than two consecutive hours, either off duty or in the sleeper berth. Neither period would count against the driver's 14-hour driving window.
- Allow one off-duty break of at least 30 minutes, but not more than three hours, that would pause a truck driver's 14-hour driving window, provided the driver takes 10 consecutive hours off-duty at the end of the work shift.

- Modify the adverse driving conditions exception by extending by two hours the maximum window during which driving is permitted.
- Modify the short-haul exception available to certain commercial drivers by lengthening the drivers' maximum on-duty period from 12 to 14 hours and extending the distance limit within which the driver may operate from 100 air miles to 150 air miles.

The FMCSA has not yet published when these changes will go into effect and is seeking comments from ELD manufacturers and the trucking industry to determine the appropriate the time needed to modify ELDs and conform to the proposed changes. The agency is yet to send its proposal for a final rule on HOS to the White House's Office of Information and Regulatory Affairs (OIRA) for statutory review.

1.2 Electronic Logging Device (ELD) Mandate

The Electronic Logging Device (ELD) rule, mandated by the FMCSA as part of MAP-21, requires ELD use by commercial drivers engaging in interstate commerce who are required to prepare hours-of-service (HOS) records of duty. It sets ELD performance and design standards, requires ELDs to be certified and registered with the FMCSA, and establishes supporting documents that drivers and carriers are federally mandated to keep. The ELD rule was published in December 2015, and manufacturers, owners and operators of commercial vehicles could begin to certify, register, and use ELDs beginning February 2016. Carriers and drivers had until December 2017 to install either an ELD or an automatic onboard recording device (AOBRD). AOBRDs installed prior to December 2017 could be used until December 2019, at which time all commercial carriers and drivers were required to have ELDs installed and used.

Not all commercial operators are bound by the ELD rule or HOS laws. Drivers who operate under short-haul exceptions are not required to keep records of duty and hence are not required to use ELDs. Further, drivers engaging in towaway operations are not required to maintain ELD use as well.

In enforcing HOS regulations, the ELD rule has had an impact on driver behavior and related truck parking demand. In 2018, Trucker Path, an app frequently used by truck drivers to identify available parking, surveyed drivers and analyzed how the implementation of the Electronic Logging Device (ELD) mandate impacted truck parking issues. Major findings from the driver survey included:

- 96 percent of drivers have parked in unauthorized areas as a result of not being able to locate available truck parking.
- 70 percent of drivers have violated HOS as a result of not being able to locate available truck parking.
- Drivers have increased the average number of times they look up information on parking availability in the Trucker Path application from April 2017 (pre-ELD mandate) to April 2018 (post-ELD mandate).
- 85 percent of drivers cite truck parking as the biggest source of stress at work.

1.3 Jason's Law

Section 1401 of MAP-21, Jason's Law, establishes a national priority for projects that address shortage of long-term parking for commercial motor vehicles on the National Highway System (NHS) to improve the safety of motorized and non-motorized users and for commercial motor vehicle operators.

Jason's Law extends the eligibility of various federal grant programs to truck-parking related projects such as:

- Constructing rest areas and truck parking facilities, and opening existing facilities to truck parking, including inspection and weigh stations and park and ride facilities
- Promoting the availability of publicly or privately provided commercial motor vehicle parking on the NHS using intelligent transportation systems and other means
- Improving the geometric design of interchanges on the NHS to improve access to commercial motor vehicle parking facilities

Jason's Law also requires all states to conduct an inventory of existing truck parking, assess the volume of commercial motor vehicles in the State, and measure the adequacy of commercial motor vehicle parking facilities in the state.

1.4 Transportation of Hazardous Materials

Section 49 of the Code of Federal Regulations, Part 397, contains federal regulations for the transportation of hazardous materials. Trucks hauling materials deemed to be hazardous are subject to more stringent parking requirements. Trucks hauling hazardous materials may not be parked within five feet of the traveled portion of a public roadway or highway. In addition, these trucks are not permitted on private property, including truck stops, without consent from the private property manager who must be made aware of the hazardous materials being transported in the truck. These vehicles also must not be located within 300 feet of bridges, tunnels, dwelling units, offices, or areas where people assemble other than for brief periods when it is impractical to park in any other place.

1.5 Commercialization of Rest Areas

Federal-Aid Highway Law (U.S. Code 23, § 111) limits the commercialization of rest areas on the interstate highway system to only vending machines for the purpose of dispensing food, drink, or other articles the state determines are appropriate and desirable. Dispensing petroleum products or motor vehicle replacement parts are not allowed. Toll roads are exempt to these restrictions because they are not a part of the federally funded Interstate System.

2. State Regulations

At the state level in Arizona, there are no specific regulations for truck parking. However, Arizona Revised Statutes § 28-873 prohibits parking any vehicle on controlled access highways except for emergency reasons or in areas specifically designated for parking such as rest areas. Entrance and exit ramps and shoulders are also considered part of controlled access highways. Commercial drivers approaching a mandatory HOS break need to be mindful of this state statute to plan ahead in order to park their trucks at appropriate locations off of interstates and highways. This statute applies to all jurisdictions in the MAG region.

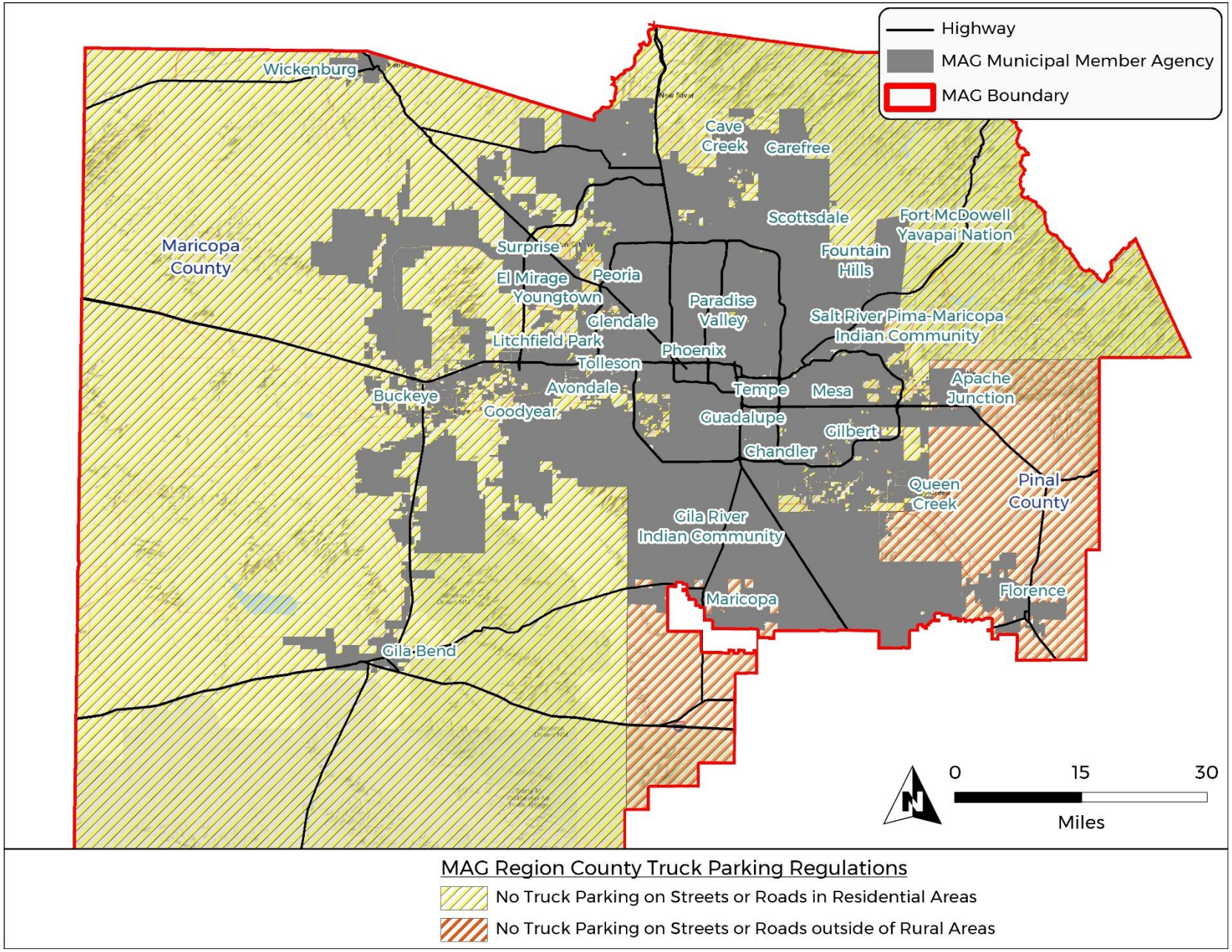
In addition to the federal regulation 49 CFR § 397 which prohibits trucks hauling hazardous materials from parking within in five feet of the traveled portion of a public roadway or highway, Arizona restricts truck carrying hazardous materials from traveling on portions of US 60 and SR 202 in Tempe and Mesa. These trucks also cannot drive through the I-10 Deck Park Tunnel through Downtown Phoenix. Arizona has designated I-17 from the I-10/I-17 Split to the I-10/I-17 Stack as the National Hazardous Materials Route (NHMR) for trucks carrying hazardous substances to travel through Phoenix. This is Arizona's only NHMR, and it will be considered during the development of solutions in terms of the need to provide appropriate locations for parking trucks hauling hazardous materials in the MAG Region.

3. County Regulations

The entirety of Maricopa County and the north and east portions of Pinal County are the only two counties within the MAG region's boundary. Maricopa County prohibits any driver from standing or parking a truck in excess of 10,000 pounds, or any tractor, semitrailer, tractor trailer, trailer, bus, or recreational vehicle on local or collector streets in its residential areas, except for commercial processes of loading and unloading. This applies only to residential areas under Maricopa County's Planning and Development Department's jurisdiction and not to any residential areas in any of the MAG region's municipalities and other governmental agencies. In the event of an emergency, truck parking is allowed in areas and times which would normally violate the local regulations in order to comply with official direction from authorities. In addition, utility and governmental trucks are exempt from these regulations when they are parked to perform a service.

Unlike Maricopa County, Pinal County has no regulation explicitly against parking trucks on county streets and roads. However, the count does prohibit standing, parking, or storing a truck in any of its 25 residential, commericial, industrial, office, activity center, and manufactured home zoning districts, except for commercial purposes of loading and unloading. This implies that drivers cannot park trucks on streets and roads within these prohibited zones. The county does allow for truck parking in any of its nine rural zone districts, it limits parking or storing trucks to one parked truck on a road adjacent to a single-family parcel where the commercially licensed driver of the truck resides, up to a maximum of two trucks parked per parcel. **Figure 2** displays the area of the MAG region subject to these county-level truck parking regulations.

Figure 2: MAG Region County Truck Parking Regulations



4. Local and Municipal Regulations

There is a variety of local and municipal truck parking regulations across the 27 municipalities and the 3 Native American Nations of the MAG region. They range from nonexistent to a complete prohibition of truck parking on any municipal street or road. Common themes among the regulations prevent truck parking on streets in residential areas for noncommercial purposes, set time restrictions for truck parking on municipal roads, and prohibiting truck parking within the city based on the weight of the vehicles. While the majority of the local regulations aim to prevent trucks from parking on streets in municipal residential zones similar to Maricopa County, all of these 30 MAG member agencies allow for truck parking in residential areas for commercial purposes in order to load and unload deliveries. Truck parking is also allowed in streets and times which would normally violate the local regulations during an emergency in order to comply with official direction from authorities. Utility and governmental trucks are also likewise exempt from these local regulations when they are parked to perform a service.

A review of the local and municipal codes and statutes indicates seven types of truck parking regulations. These include six regulation categories that are not related to weight and one weight regulation category that has been further divided to more specific restrictions based on threshold:

- No Local or Municipal Regulation
- No Truck Parking in Residential Areas
- No Truck Parking on City Streets
- Regulations for Trailer and Semi-trailer Parking Only
- Time Restrictions for Truck Parking
- Time Restrictions for Truck Parking on all Street & No Truck Parking in Residential Areas
- Weight Regulations for Truck Parking
    - Heavyweight Restrictions for Truck Parking in Residential Areas
    - Lightweight Restrictions for Truck Parking in Residential Areas
    - Lightweight Restrictions for Truck Parking on City Streets

Table 1 shows the breakdown of the 30 non-county MAG member agencies that apply non-weight related truck parking regulations, and **Table 2** presents the municipalities that regulate truck parking by weight according to their respective threshold

Figure 3 illustrates the local jurisdictions and Native American Nations according to their category of truck parking regulation.

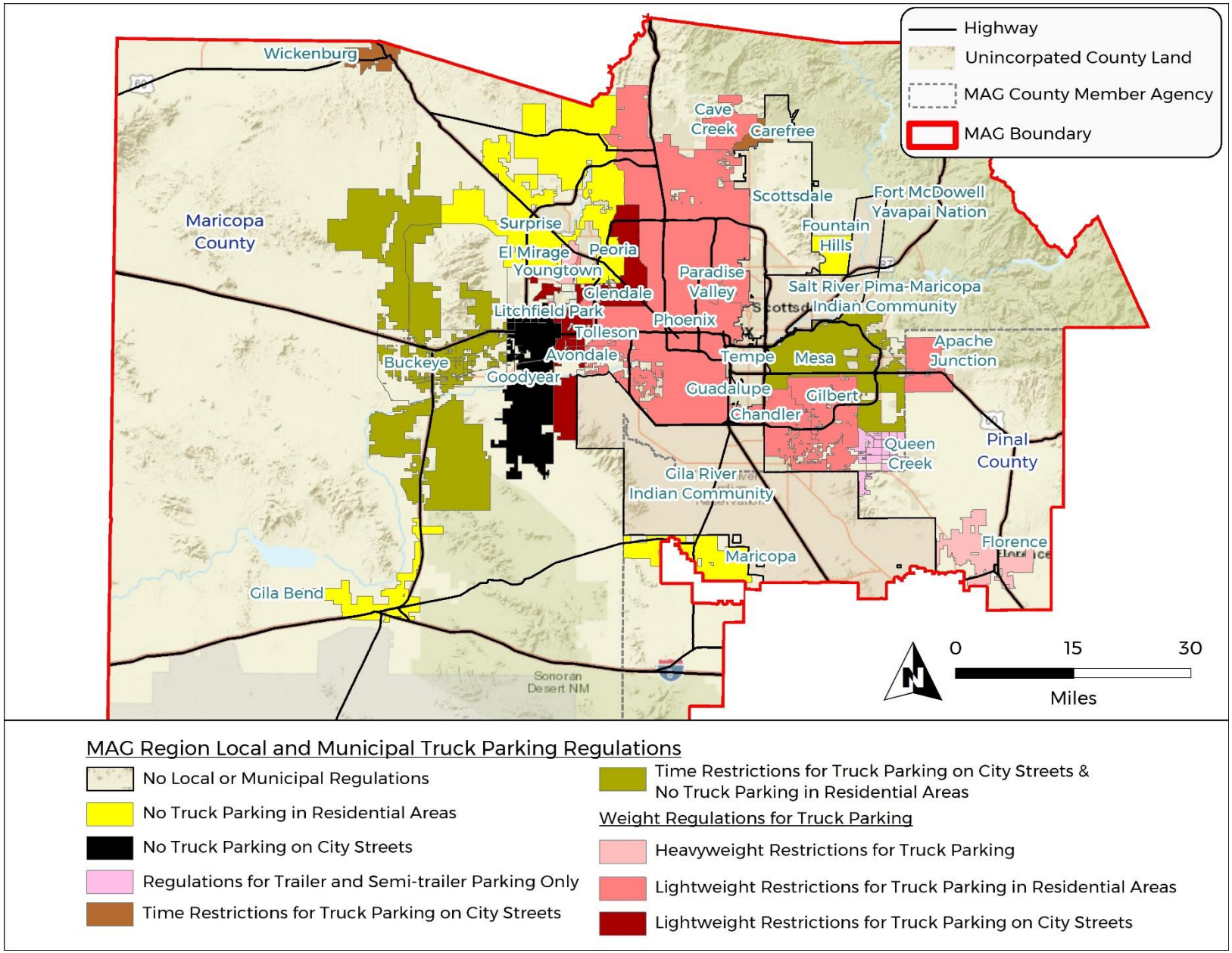
Table 1: Non-weight Regulations for Truck Parking in MAG Region

Non-weight Regulations for Truck Parking in MAG Region					
No Local or Municipal Regulations (6)	**No Truck Parking in Residential Areas (5)**	**No Truck Parking on City Streets (1)**	**Regulations for Trailer and Semi-Trailer Parking (1)**	**Time Restrictions for Parking on City Streets (2)**	**Time Restrictions for Truck Parking on City Streets & No Truck Parking in Residential Areas (2)**
• Guadalupe • Scottsdale • Tempe • Fort McDowell Yavapai Nation • Gila River Indian Community • Salt River Pima-Maricopa Indian Community	• Fountain Hills • Gila Bend • Maricopa • Peoria • Surprise	• Goodyear	• Queen Creek	• Carefree • Wickenburg	• Buckeye • Mesa

Table 2: Weight Regulations for Truck Parking in MAG Region

Weight Regulations for Truck Parking in MAG Region		
Heavyweight Restrictions for Truck Parking (2)	**Lightweight Restrictions for Truck Parking in Residential Areas (9)**	**Lightweight Restrictions for Truck Parking on City Streets (2)**
• El Mirage (>25,000 pounds) • Florence (>26,000 pounds)	• Apache Junction (>10,000 pounds) • Cave Creek (>13,000 pounds) • Chandler (>14,500 pounds) • Gilbert (chassis rating >1 ton/2,000 pounds) • Litchfield Park (>11,500 pounds) • Paradise Valley (>10,000 pounds) • Phoenix (chassis rating >0.75 tons/1,500 pounds) • Tolleson (chassis rating >1 ton/2,000 pounds) • Youngtown (>12,000 pounds)	• Avondale (>10,000 pounds) • Glendale (chassis rating >1 ton/2,000 pounds)

Figure 3: MAG Region Local and Municipal Truck Parking Regulations



4.1 No Local or Municipal Regulations

- The three Native American Nations that are agency members of the MAG region - the Fort MacDowell Yavapai Nation, the Gila River Indian Community, and the Salt River Pima-Maricopa Indian Community - have no regulations pertaining to truck parking on the roads within their jurisdiction.
- Even though they are, respectively, the fifth and eigth most populous cities in Arizona, Scottsdale and Tempe have no regulations on truck parking in effect within their municipal limits.
- The Town of Guadalupe also does not regulate truck parking in its jurisdiction.

4.2 No Truck Parking in Residential Areas

- Fountain Hills, Gila Bend, Maricopa, Peoria, and Surprise all have regulations prohibiting the standing or parking of trucks on streets in residential areas, except for commercial purposes of loading and unloading.
- Gila Bend does allow for truck parking on nonresidential if it does not exceed 48 consecutive hours.

4.3 No Truck Parking on City Streets

- Goodyear is the only municipality to prohibit all parking of all commercial and freight trucks on its streets without considering a minimum threshold weight of the vehicle.

4.4 Regulations for Trailer and Semi-Trailer Parking Only

- Rather than addressing truck parking, Queen Creek only prohibits the parking of trailers and semi-trailers on its streets. There is no reference to any regulation pertaining to parking the cab portion of commercial trucks on its municipal streets.

4.5 Time Restrictions for Truck Parking on City Streets

- In the Time Restrictions for Truck Parking cateogry, the Carefree and Wickenburg take different approaches.
- Carefree prohibits truck parking on its municipal streets from 12:00 midnight and 5:00 a.m.
- Wickenburg limits truck parking on its municipal streets for 48 consecutive hours.

4.6 Time Restrictions for Truck Parking on City Streets & No Truck Parking in Residential Areas

- While they prohibit truck parking on all streets in their residential areas, the Cities of Buckeye and Mesa also have time restrictions for parking trucks on streets in the nonresidential areas.
- Buckeye prohibits truck parking on any of its streets from 10:00 p.m. to 5:00 a.m.
- Mesa limits truck parking on nonresidential streets to 2 hours for commercial purposes.

4.7 Weight Regulations for Truck Parking

- 13 municipalities have established Weight Restrictions for Truck Parking. These jurisdictions either regulate the gross vehicle weight of a truck or a truck's chassis manufacturer rating to limit truck parking on municipal streets. The weight restrictions can be further categorized as follows:

4.7.1 Heavyweight Restrictions for Truck Parking in Residential Areas

  - El Mirage restricts parking of trucks weighing over 25,000 pounds from parking on streets in residential areas.
  - Florence prohibits trucks over 26,000 pounds from parking, standing, loading, or unloading on Main Street between Butte Avenue and Ruggles Street.

4.7.2 Lightweight Restrictions for Truck Parking in Residential Areas

- Six municipalities restrict truck parking in residential areas based on lightweight threshold of a truck's gross vehicle weight (GVW) ranging from 10,000 pounds-14,500 pounds as shown in Table Z.Z. Apache Junction and Paradise Valley have the lightest weight threshold for allowing truck parking at 10,000 pounds. **Table 3** lists the MAG Region municipalities that have Llightweight GVW threshold restrictions.

Table 3: Lightweight GVW Threshold Municipalities

Municipality	Lightweight GVW Threshold
Apache Junction	**10,000 pounds**
Paradise Valley	**10,000 pounds**
Litchfield Park	**11,500 pounds**
Youngtown	**12,000 pounds**
Cave Creek	**13,000 pounds**
Chandler	**14,500 pounds**

- Three municipalities restrict truck parking based on a truck's chassis manufacturer rating. Gilbert and the Tolleson prohibit trucks with a chassis rating exceeding one ton (2,000 pounds) from parking on a steet in a residential area, whereas Phoenix lowers the chassis threshold to 0.75 tons (1,500 pounds) for restricting truck parking on residential streets.

4.7.3 Lightweight Restrictions for Truck Parking on City Streets

- Both Avondale and Glendale effectively prohibit truck parking on their municipal streets due to their lightweight thresholds for prohibiting truck parking on their city streets.
- Avondale restricts trucks over 10,000 pounds and having a 1 ton (2,000 pounds) chassis rating from parking on any city street.
- Glendale prohibits truck parking if the vehicle chassis rating exceeds 1 ton (2,000 pounds).

5. Regulatory Conclusion

The five categories of federal regulations for truck parking force drivers to navigate and balance their overlapping interactions. The federal rules seek to provide truck drivers with adequate rest by setting work limits, while also establishing driver safety as a high priority during both times of travel and mandated rest. A shortage of truck parking can result drivers spending excessive time looking for parking to comply with federal requirements and potentially lead to commercial freight delivery delays.

In Arizona at the state and county levels within the MAG Region, the truck parking regulations prohibit drivers from parking trucks on the side of controlled-access highways and from parking on streets in residentially zoned areas. Exceptions to these apply in emergency situatuations or, in the case of residential area truck parking restrictions, during the commercial processes of loading and unloading for local deliveries.

The main focus on local truck parking regulations in the MAG Region is preventing it on streets in residential areas. The 30 localities have varying levels of limitation for truck drivers. Municipalities on the suburban fringe

are more likely to have regulations prohibiting truck parking in residential areas without distinction**.** The strictest restrictions are found in the west suburb localities adjacent to Interstate 10, a major freight corridor. Cities and towns that restrict residential truck parking based on weight thresholds tend to be central in the MAG Region or in the east suburbs along Interstate 10. Note that the boundary of Phoenix covers almost the entire central portion of the MAG Region, so its weight regulation applies to a large portion of the region.

Time regulations are seldom employed for prohibiting trucks from parking on local streets. The time restrictions in Buckeye and Carefree effectively prevent overnight truck parking on city streets. On the other end of the spectrum, the two exurban towns of Gila Bend and Wickenburg allow drivers to park their trucks on nonresidential roads for up to 48 consecutive hours.

Scottsdale, Tempe, and Guadalupe are the only three municipalities do not have any regulations regarding truck parking. All three of the Native American communities in the MAG Region also have no regulations pertaining to truck parking on streets.

III. Best Practices Review

1. National Coalition on Parking

The National Coalition on Truck Parking (NCTP) is an FHWA initiative that created four working groups to implement various truck parking opportunities identified in the 2016 National Coalition of Truck Parking Activity Report. These working groups focused on parking capacity, data and technology, innovative funding options, and state and local government coordination. The following is a brief summary of the work that has been done in these areas, and the recommendations provided.

1.1 Parking Capacity

The Parking Capacity working group developed three work products to assist states in developing strategies to increase truck parking capacity:

- **Creative use of Right-of-Way (ROW)**: This document provides examples of low-cost solutions for creating parking capacity using existing facilities in ROW or adjacent to the ROW. The examples focused on rest area and weigh station conversions to increase truck parking capacity, as well as on attempts to create parking at tourism centers. Other examples included truck parking inside an interchange (at Big Springs, Nebraska), and consolidation of public ROW at the Golden Glades Interchange in northern Miami-Dade County to accommodate truck parking.
- **Involving Shippers/Receivers to Address Truck Parking Capacity**: This document provided examples of methods that private companies have used to alleviate the shortage of truck parking. These strategies include:
    - Providing designated “bullpen” areas outside distribution centers
    - Using dispatchers to assign drivers parking spots at or near distribution centers for staging purposes
- **Considerations for Low Cost Truck Parking**: This document describes some of the factors truck parking operators may consider to minimize maintenance and operation costs at their facilities. These factors include:
    - Trash removal
    - Using soil-cement as a low-cost paving material
    - Vault toilets
    - Safety measures such as emergency phones, fire extinguishers, and defibrillators

1.2 Data and Technology

The Data and Technology working group, chaired by ATRI, developed several products and recommendations:

- **Truck Parking App Survey:** This document provided a summary of a truck driver survey ATRI conducted at the Mid America Trucking Show in Louisville, KY to determine truck driver opinions on parking apps. The survey found that mapping features and driver-input on parking spot availability are the two most important features. Trucker Path and myPilot are the two most popular apps used by truckers to find available truck parking.

- **Best Practices for Truck Parking Availability Detection and Information Dissemination by States**: This document described the implementations of Truck Parking Information Management System (TPIMS) used by different states that are part of the Mid America Association of State Transportation Officials (MAASTO). These states are Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Ohio, and Wisconsin. The goal of TPIMS is to reduce time searching for truck parking by monitoring parking space availability and utilization at truck stops and providing real-time communication to drivers.

  Examples of TPIMS implementations included:

  - Entry/exit sensors used by Indiana DOT and Kentucky DOT that count the number of trucks using parking lots.
  - In-pavement and entrance/exit ramp sensors used by Iowa DOT.
  - "Computer vision" system used by Kansas DOT that employs cameras at 18 rest areas along I-70 to build a "3D image" of the parking area, and automatically identifies available spaces.
  - The use of stereoscopic video analytics by Minnesota DOT.
  - Other similar systems used by states such as California, Colorado, and Florida.
- **A recommended guidebook on standards and Best Practices for national TPIMS program:** A selection of best practices summarized by the guidebook on Best Practices for Truck Parking Availability Detection and Information Dissemination is provided below in **Table 4**.

Table 4: Selection of Innovative Truck Parking Solutions Summarized by NCTP (2018)

Project	Caltrans	Minnesota DOT	Colorado DOT	Florida DOT	Michigan DOT	Wisconsin DOT
Sensing Technology	Multi-camera system, inductive loops and GPS-based system (Information from the ConOps. Implementation might differ).	Multi-camera system.	Combination of static cameras and sensors. Information is not available.	In-pavement sensors and CCTV cameras will be used for rest areas and welcome centers. Microwave systems will be used for weigh stations.	For public rest stops, a combination of CCTV and in-ground magnetometers. For private truck stops, elevated camera sensors.	Multi-camera system in one rest area and a count in/out microwave system, along with CCTV cameras for error correction in three rest areas.

Project	Caltrans	Minnesota DOT	Colorado DOT	Florida DOT	Michigan DOT	Wisconsin DOT
Information Dissemination	Website, mobile apps, and IVR.	DMS, website, in-cab geolocation application device integrated with existing ELD and XML feeds for third- party use.	DMS with type "A" Inserts, website, mobile apps, and XML feeds for third-party use.	DMS, website, mobile apps, DSRC-enabled in- cab devices, and XML feeds for third-party use.	DMS with type "A" inserts, DSRC-enabled in-cab devices, websites, and mobile apps.	Website, DMS with type "A" inserts, in-cab devices, mobile apps, and XML feeds for third-party use.
Other features	Reservations are part of the plan, but not implemented yet.	(none)	Parking reservations and parking forecasting service will be implemented in the future.	Reservations are part of the plan, but not implemented yet. Parking forecasting will be a feature added in the future.	(none)	(none)

Source: https://ops.fhwa.dot.gov/freight/infrastructure/truck_parking/workinggroups/technology_data/product/best_practices.pdf

1.3 Funding, Financing, and Regulations

The Funding, Financing, and Regulations working group developed two work products:

- **Emissions Reduction Grant Programs Fact Sheet:** This document provides an overview of the various emission reductions grant programs available to states and local governments to fund transportation projects. The document discussed the Congestion Mitigation and Air Quality (CMAQ) program and the Diesel Emissions Reduction Act (DERA) program. It also provided examples of CMAQ and DERA-eligible Idle Reduction Technology (IRT) system implementations and truck stop electrification projects.
- **Public-Private Partnerships (P3) Examples and Considerations**: This document highlighted P3 initiatives and non-traditional funding sources to increase truck parking capacity. Examples included:
    - The use of a P3 to develop the Brainerd Lakes Area Welcome Center in Minnesota, which provides short-term truck parking, bathrooms, and vending machines.
    - An agreement between Virginia DOT and private sector sponsors through which the private sector may sponsor Virginia rest areas to assist funding of operation costs.
    - The leveraging of local fuel tax revenue by the City of Decatur to incentivize a private company to create a truck stop in the community.

1.4 State, Local, and Regional Government Coordination

The State, Local, and Regional Government Coordination working group developed four products:

- **MPO-101 (How to improve truck parking in your region):** This guide provides background on the structure and responsibilities of an MPO and recommends reaching out to MPO officials or joining MPO freight advisory committees in order to establish relationships with other local agencies and representatives of truck parking stakeholders. This guide lists
- **Parking and Staging Requirements in Local Zoning:** This document provides examples of local governments efforts, including provision of truck parking and staging in local planning and zoning.
    - This document highlighted the 2017 City of Chicago Downtown Loading Zone Reform pilot as an example of an initiative to establish truck parking ordinances for zones that frequently generate truck traffic. The pilot converted all business-paid commercial curbside loading zones to user-paid curbside loading zones in the central business district. The intention of the Chicago program was to help balance parking supply and demand, improve traffic flow, and increase availability of parking. The pilot detailed multiple causes of parking congestion:
        - Non-commercial vehicles used loading zones due to a lack of signage and/or confusion about what a loading zone is.
        - Business owners pay for loading zones, while use of the space is not limited to their business needs.
        - Misuse of loading zones led to double parking and traffic congestion when commercial operators could not find a space.
    - After the pilot program proved successful, the initiative expanded to other congested areas and was added to the Municipal Code of Chicago under section 9-64-165: Commercial loading zones.
    - The document further recommends that standards could be set for truck parking and staging areas relative to the number of loading zones. Traffic impact studies could also be used to estimate the amount of truck trips that will be generated by a proposed use. Having provisions for truck parking in the zoning ordinance also allows the community to set standards for siting and design to ensure compatibility with surrounding land uses.
    - The document also details examples of local municipalities enacting zoning laws to permit overnight parking on city-owned land zoned for industrial uses. These examples include:
        - The City of Weed, CA created municipal truck parking for about 30 trucks on two pieces of city-owned land zoned for industrial use in proximity to Interstate 5. Truckers are permitted to park for up to 72 hours.
        - Moreno Valley, CA designated certain public land solely for overnight truck parking and others for truck parking at all times.

    - The City of Elmira created a municipal truck parking area from an existing industrial-zoned lot adjacent to a carpool parking lot, providing about 25 truck parking spaces for which the city charges $5 per day.

- **The Importance of Considering Truck Parking in Local Zoning:** This document highlights the safety, commercial and congestion relief benefits that local communities may obtain from considering truck parking in plans for commercial development.
- **Including Truck Parking in State and Metropolitan Planning Organization (MPO) Freight Plans:** This document highlights examples of state and MPO truck parking plans.

2. State Truck Parking Plans

2.1 ADOT (2019) Arizona Truck Parking Study

This is an ongoing project conducted by the Arizona Department of Transportation (ADOT).

2.1.1 Survey and Outreach

This study conducted an online survey of truck drivers with the help of the Arizona Trucking Association, and the Owner Operators Independent Driver Association (OOIDA). This survey achieved 164 responses from truck drivers that operate at least partially in the state. Various stakeholders were also consulted in developing their conclusions.

From the survey and consultations, this study found the following were the main reasons for truck parking: 1) legally-required 10+ hour rest breaks, 2) legally-required 30 min rest breaks, 3) short breaks for meals and restrooms, and 4) staging for pick-up or delivery at specific businesses. Different types of trucking were found to have different parking needs. Long-haul trucking required both legally mandated breaks and short rest breaks, while short-haul trucking only required short rest breaks.

The survey found that 93 percent of truck drivers had problems finding available spaces. Half of these problems finding parking occurred in urban areas. Also, 72 percent of truck drivers indicated that parking availability has gotten much worse or worse during the past year. The inability to find truck parking was found to generate the following problems:

- **Increased time searching for parking**: Half of all respondents indicated that they spend more than 16 minutes searching for parking. As parking availability decreases, drivers spend even more time searching, which has a large negative impact on productivity.
- **Stop early to secure available parking spot**: Since parking demand peaks in the evening, some drivers might give up searching and secure a spot earlier in the day than they would prefer. In Arizona, 63 percent of drivers give up 30 minutes or more of productive drive time to find a stop.
- **Parking in undesignated locations**: In Arizona, 77 percent of drivers indicated that they park in undesignated locations at least once per week, with 36 percent indicated that they park 1-3 times per week, 6 percent indicated they park 4-6 times per week, and 9 percent indicated that they use undesignated spots daily. Drivers are forced to use undesignated locations when they cannot find a spot that allows them to meet their delivery schedules and satisfy HOS regulations.

The survey found the following potential solutions:

- **Improved parking information:** The top 3 sources of information were smartphone applications, variable message signs, and in-cab messaging systems. About 41 percent of respondents preferred to receive parking information 20 miles or more ahead of the parking location.
- **Reservation of Parking Spaces:** Around 28 percent of respondents indicated that they are willing to pay to reserve a parking space. This finding falls in line with previous studies. While a small percent, this could represent a way of ensure parking availability. Around 13 percent indicated that they would be willing to pay $1 to $5 per reservation, which is less than the typical reservation fees at major truck stop chains.

The survey also asked about the factors that respondents perceived as limiting parking availability. Most respondents blamed the HOS regulations and lack of new construction to keep up with traffic increases. This report then described in detail the HOS regulations, how trucks manage these restrictions, the violations recorded throughout the state, and the effect of Electronic Logging Devices. The study further described economic factors that are leading truck traffic to increase (with corresponding increases of parking demand), including recent changes in the structure of supply-chains. The effect of recent innovations in truck technology were also discussed, albeit at a high-level.

2.1.2 Supply and Demand Analysis

This study developed an inventory of truck parking locations in Arizona. This included public rest areas (owned and operated by the Arizona Department of Transportation) and private truck stop facilities. The inventory described overflow capacity (from satellite imagery) and amenities.

Informal/undesignated parking locations (inspection stations, closed rest areas, etc.) were identified manually by looking at clusters of parked trucks from ATRI's GPS data, as shown in Figure 3. The study found that most truck parking was in private truck stops, including some at vacant warehouses.

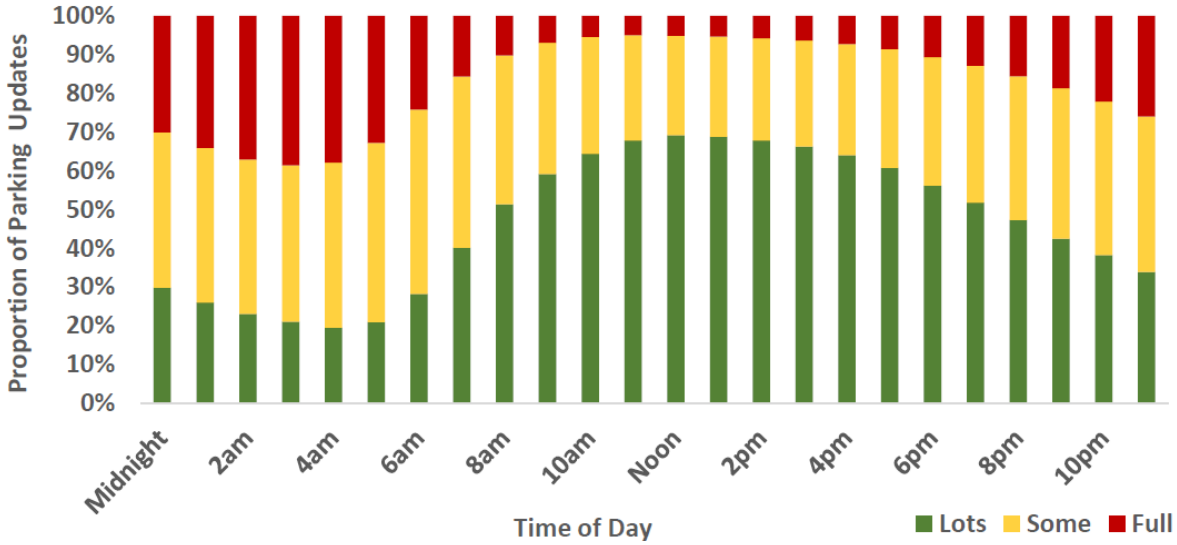
Figure 4: Identification of Informal Parking Stops

Source: CPCS Analysis of ATRI GPS Data

Truck GPS data was used to provide insights into different aspects of truck parking, including how demand varied throughout the day, the length of stay, and types of trips involved. Several descriptive figures were included for statewide parking demand.

To assess the availability of truck parking information, this study analyzed crowdsourced data from Trucker Path, as shown in Figure 4. This data only covered locations being monitored by the Trucker Path application (designated only), excluding facilities with few records. This application asks truck drivers to rate whether there are “lots,” “some,” or “none” parking spaces available at specific facilities.

Figure 5: Truck Parking Availability

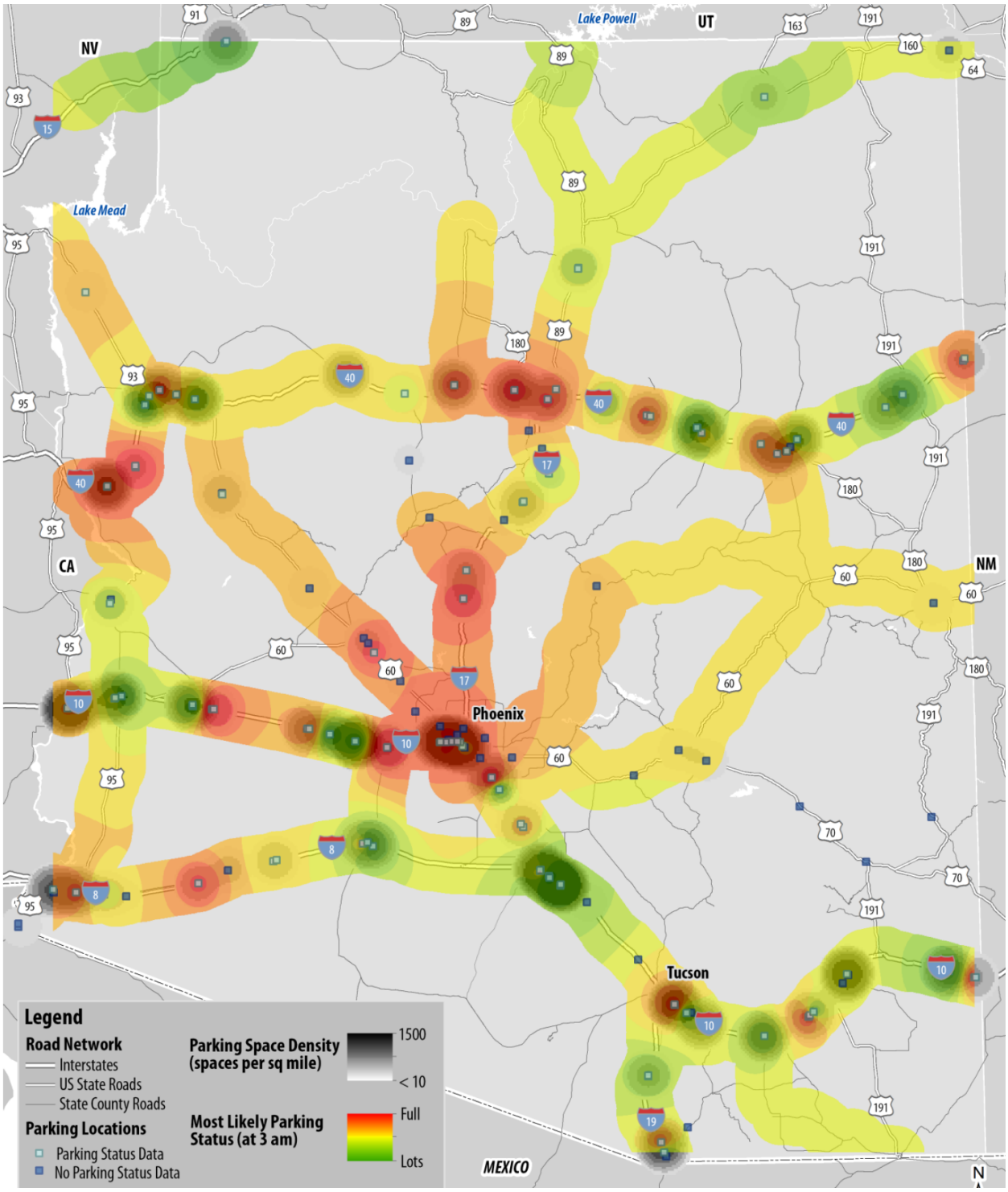


Source: CPCS Analysis of Trucker Path Data

Gaps in the supply and demand of parking spaces were identified as shown in Figure 5 by overlaying two pieces of information on maps: the density of parking spaces per sq. mile (from the inventory), and the availability of those spaces as reported by Trucker Path. This analysis was conducted for 6 times of day to capture how availability changes throughout the day. This analysis identifies places that have open spaces during high demand periods, and vice versa. The analysis was then conducted in greater detail for specific corridors. A limitation of this analysis is that the Trucker Path application only considers designated parking facilities.

To quantify undesignated truck parking, the study conducted a cluster analysis of data from ATRI. This was a manual process that did not rely on algorithms. It is unclear the level of detail used in the manual identification, or the criteria used to filter truck stops for other reasons (such as making deliveries).

Figure 6: Location of Truck Parking Demand



Source: CPCS

2.1.3 ADOT Truck Parking Study Solutions

The implementation plan was developed using input from the Truck Parking Advisory Group, project readiness, and the prioritization process. Phasing the implementation plan will allow ADOT to make incremental improvements to truck parking while developing projects, implementing policies, and soliciting private sector interest in partnership. **Table 5** is a summary of some of the implementation plan's innovative projects and policies and their respective phase.

Table 5: Innovative Solutions of the Arizona Truck Parking Implementation Plan (2019)

Solution	Implementation Phase
Integrate Truck Parking System into Arizona's 511 System	Phase I
Determine Feasibility of Wyoming-Style "Truck Turnouts	Phase I
Develop Design Standards & Identify Alternate Truck Parking Locations	Phase I
Designate a Truck Parking Champion to Implement Truck Parking Recommendations	Phase II
Develop a Truck Parking Information Management System (TPIMS) Proof of Concept	Phase II
Promote Truck Parking Public-Private Partnership	Phase II

Source: ADOT Arizona Truck Parking Study (2019)

2.2 VDOT (2015) Virginia Truck Parking Study

The Virginia Department of Transportation (VDOT) published the Virginia Truck Parking Study in 2015.

2.2.1 Survey and Outreach

The study reached out to five separate stakeholder groups (state troopers, VDOT staff, VDOT rest area staff, truck drivers, and owners and operators of truck stops).

Truck Drivers

An online survey was administered to approximately 3,000 members of OOIDA in Virginia, 580 members of the Virginia Trucking Association (VTA), and 3,131 members of ATA, yielding 445 responses. The main findings were:

- Most respondents reported having parked in undesignated areas such as shoulders of ramps for *both short-term and long-term parking needs.*
- VDOT rest areas were preferred over private truck stops for short term parking (33 percent vs 26 percent), whereas for longer term parking, private truck stops were widely preferred over VDOT rest areas (49 percent vs 15 percent)
- 97 percent of respondents indicated the lack of sufficient parking spaces at rest areas, particularly overnight.

State Troopers

A survey of 1,000 state troopers indicated that more than half of the respondents had observed trucks parking in undesignated spots, such as highway ramps. Ninety percent of such undesignated parking was observed overnight. This is in part caused by designated parking being over capacity, with 66 percent of respondents confirming this finding. Of the state troopers observing undesignated parking, 70 percent indicate that they request the driver to move. Since HOS compliance is a primary reason for seeking

parking, requesting drivers to find somewhere else to park may introduce issues with HOS compliance. It is worth noting that this survey was conducted before the ELD mandate took effect in 2018, which may affect enforcement attitudes.

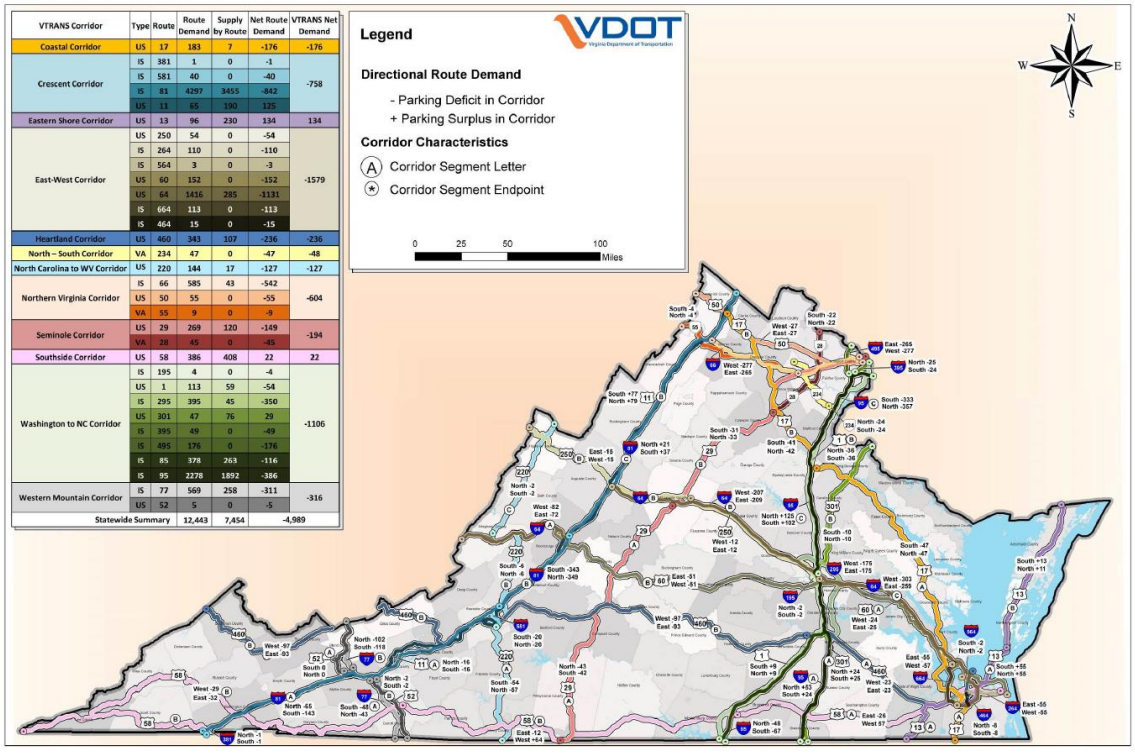
Rest Area Staff

VDOT maintains 43 public rest areas, of which 36 include truck parking. A survey of VDOT rest area staff indicated that 97 percent of these rest areas are over capacity, with trucks regularly parking on exit ramps at over 80 percent of the facilities.

2.2.2 Supply and Demand Analysis

The study also developed a demand profile for truck parking spaces in the various freight corridors. To this end, the authors used the demand equation from the FHWA *Study of Adequacy of Commercial Truck Parking Facilities – Technical Report* to calculate the demand for truck stops. The average parking duration per hour of travel came from "*Truck Parking in Pennsylvania – Final Report*," a 2007 report from the Pennsylvania State Transportation Advisory Committee. The parking demand calculated by this equation was then matched against existing truck parking supply in Virginia to identify gaps. The results of this analysis are presented in **Figure 7** and **Figure 8**.

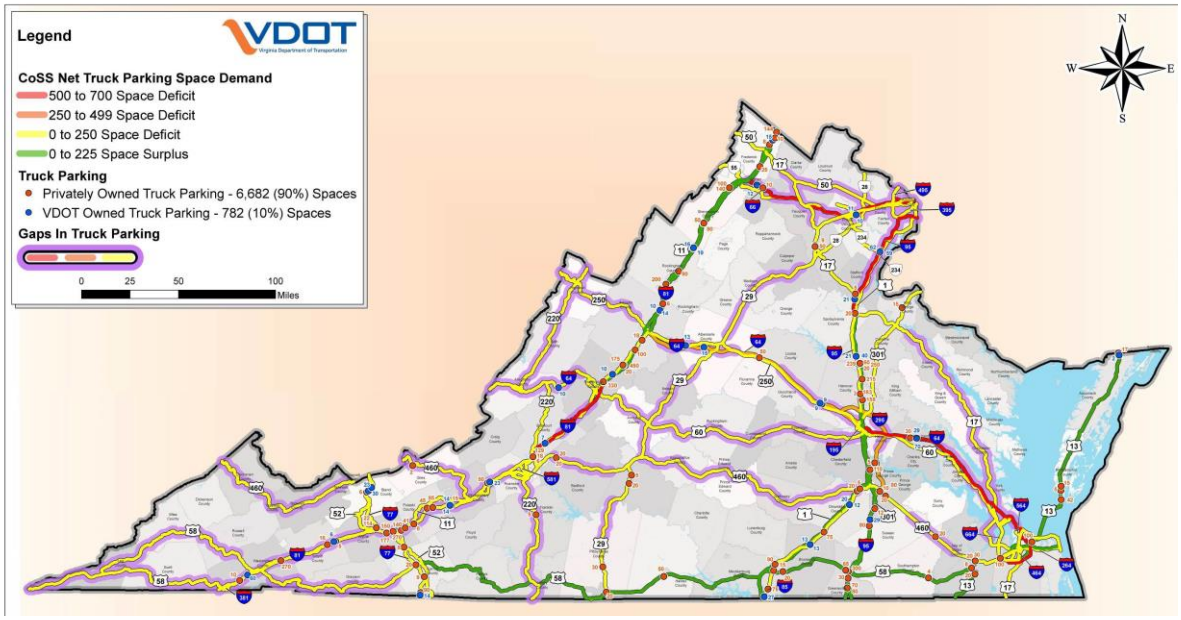
Figure 7: Truck Parking Demand Profile



VTRANS Corridor	Type	Route	Route Demand	Supply by Route	Net Route Demand	VTRANS Net Demand
Coastal Corridor	US	17	183	7	-176	-176
Crescent Corridor	IS	381	1	0	-1	-758
	IS	581	40	0	-40	
	IS	81	4297	3455	-842	
	US	11	65	190	125	
Eastern Shore Corridor	US	13	96	230	134	134
East-West Corridor	US	250	54	0	-54	-1579
	IS	264	110	0	-110	
	IS	564	3	0	-3	
	US	60	152	0	-152	
	US	64	1416	285	-1131	
	IS	664	113	0	-113	
	IS	464	15	0	-15	
Heartland Corridor	US	460	343	107	-236	-236
North – South Corridor	VA	234	47	0	-47	-48
North Carolina to WV Corridor	US	220	144	17	-127	-127
Northern Virginia Corridor	IS	66	585	43	-542	-604
	US	50	55	0	-55	
	VA	55	9	0	-9	
Seminole Corridor	US	29	269	120	-149	-194
	VA	28	45	0	-45	
Southside Corridor	US	58	386	408	22	22
Washington to NC Corridor	IS	195	4	0	-4	-1106
	US	1	113	59	-54	
	IS	295	395	45	-350	
	US	301	47	76	29	
	IS	395	49	0	-49	
	IS	495	176	0	-176	
	IS	85	378	263	-116	
	IS	95	2278	1892	-386	
Western Mountain Corridor	IS	77	569	258	-311	-316
	US	52	5	0	-5	
Statewide Summary			12,443	7,454	-4,989	

Source: Virginia Truck Parking Study

Figure 8: Net Truck Parking Space Demand



Source: Virginia Truck Parking Study

2.3 UDOT (2012) Utah I-15 Truck Parking Study

Using a Federal Highway Administration grant, the Utah Department of Transportation (UDOT) completed in 2012 a study on truck parking needs along 400 miles of I-15 in Utah. The primary objectives were to understand the adequacy of truck parking facilities along I-15, and hear from truck drivers about parking issues in general.

2.3.1 Survey and Outreach

A survey was completed by 433 truck drivers at commercial truck stops. The survey sought to gain insights into truck drivers' experience with long-term parking (defined as more than four hours) along the I-15 corridor. The main findings were:

- Commercial truck stops and public rest areas are the main parking options available to truck drivers. Drivers tend to prefer public rest areas for short-term parking, while they prefer commercial truck stops for long-term parking (more than four hours) and meals. Restrooms, convenient connection to the highway, showers, and refueling service are the features that are most important to drivers.
- Almost all drivers determine their own stopping locations, and the majority do so while driving. Road conditions and speed may affect compliance with HOS regulations, therefore rest locations often need to be evaluated mid-trip. Only 21 percent of drivers plan where to stop before they started driving for the day.
- Most drivers indicate they would plan long-term rest stops better if they were aware of the locations of parking facilities, which highlights the need for better signage and roadside parking information. More than half of the drivers surveyed would prefer to know the number of spaces available and amenities at parking facilities along the direction of travel.

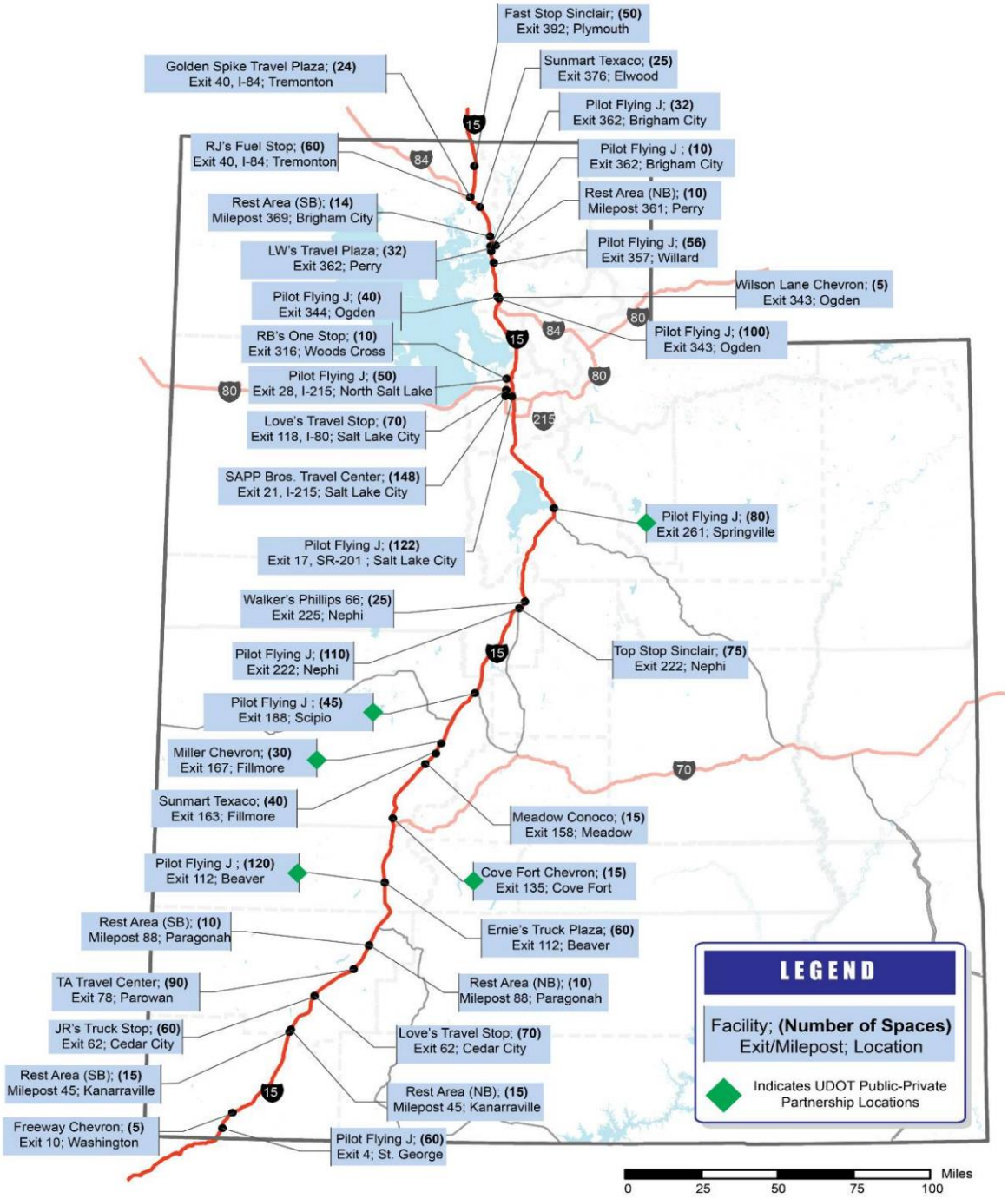
- More than 70 percent of respondents indicated that the primary reasons for parking on shoulders and on/off ramps were the lack of information about nearby parking facilities and the lack of available spaces. Blocked spaces and convenience of getting back on the highway were other reasons for undesignated parking.
- In addition to expanding truck parking facilities along the I-15 corridors, drivers would also like to see time limits on truck parking eliminated (used to ration available spaces at public parking facilities), and the layout and configuration of facilities improved (such as pull-through spaces and marked spaces).

UDOT also conducted interviews with long-haul truck drivers and commercial truck stop owners and operators. Both long-haul drivers and truck stop operators suggested increasing the amount of parking signage on the highway (such as "truck stop ahead" or "next rest area"), and identifying truck stops and parking facilities on maps distributed by UDOT. Participants suggested distributing such maps and other resources at state welcome centers, ports-of-entry, public rest areas, and commercial truck stops.

2.3.2 Supply and Demand Analysis

An inventory of known commercial truck stops, public rest areas, and ports-of-entry along the I-15 corridor was completed by UDOT. The port-of-entry inventory was developed through calls to individual ports-of-entry, where the number of spaces available for long-term parking was confirmed. The commercial truck stop inventory was verified against commercial truck stop directories and guides, while the public rest areas inventory was compared to the Utah Statewide Rest Area Plan. An overview of these known parking facilities is presented in **Figure 9**.

Figure 9: Public Rest Areas and Commercial Truck Stops on I-15 in Utah



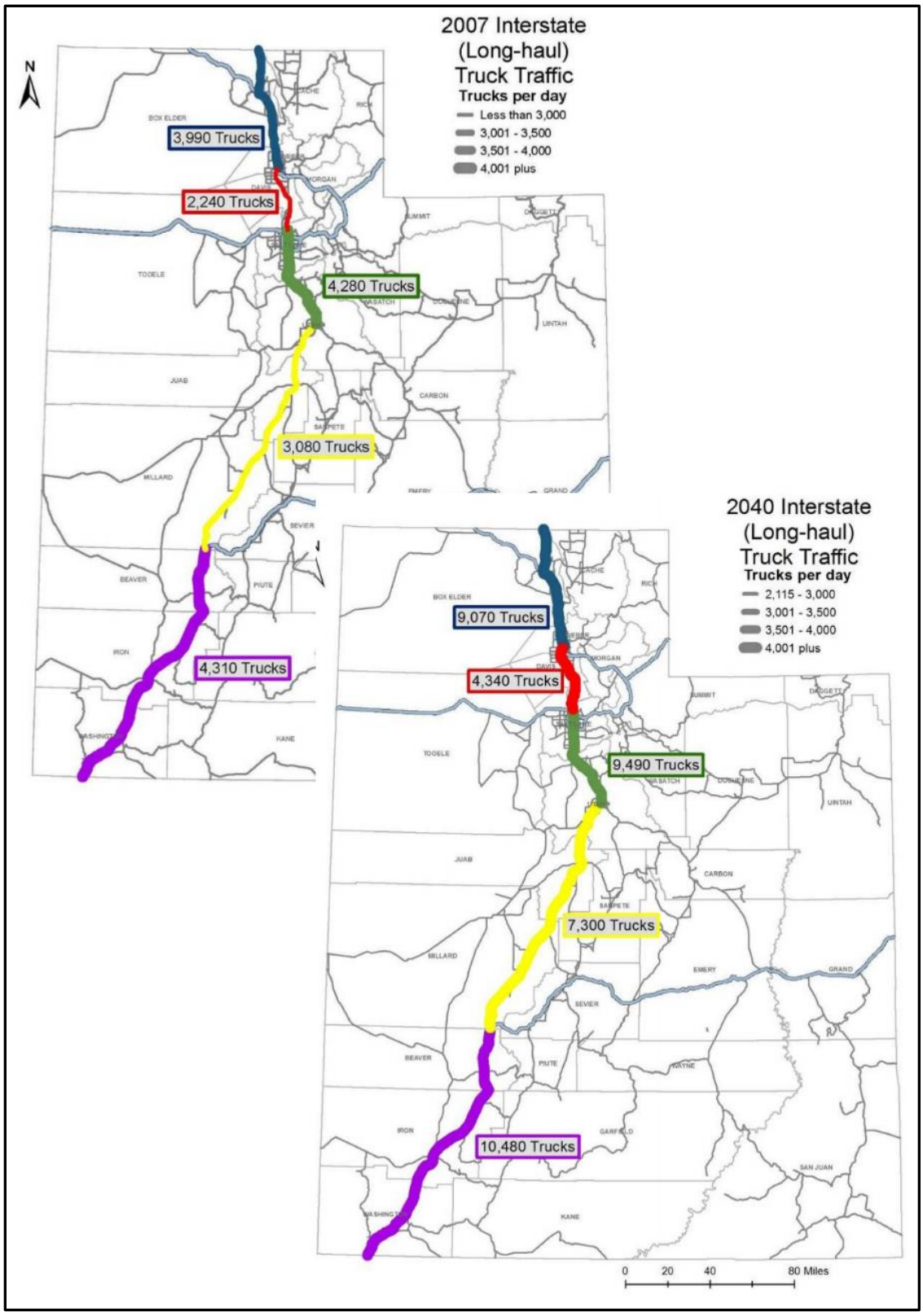
Source: Utah I-15 Truck Parking Study

Truck parking demand was calculated using the *Study of Adequacy of Commercial Truck Parking Facilities* developed by FHWA in 2002. This method implicitly assumes that demand for parking can be explained better by truck-hours of driving than by the locations or attributes of parking facilities. This represents an assumption that could be relaxed in future studies with the appropriate data.

Demand was estimated by first determining the long-haul truck traffic over 5 segments of the I-15 corridor. This was done using a combination of Freight Analysis Framework 3 (FAF3) data, and origin-destination data from the Truck Parking Survey. Truck flows were routed on I-15 using the shortest path method between freight districts and matched with the reported truck traffic at Utah's borders to estimate long-haul traffic (presented in **Figure 10**). Short-haul truck traffic was calculated by subtracting the estimated long-haul truck traffic on each highway segment from the reported truck traffic.

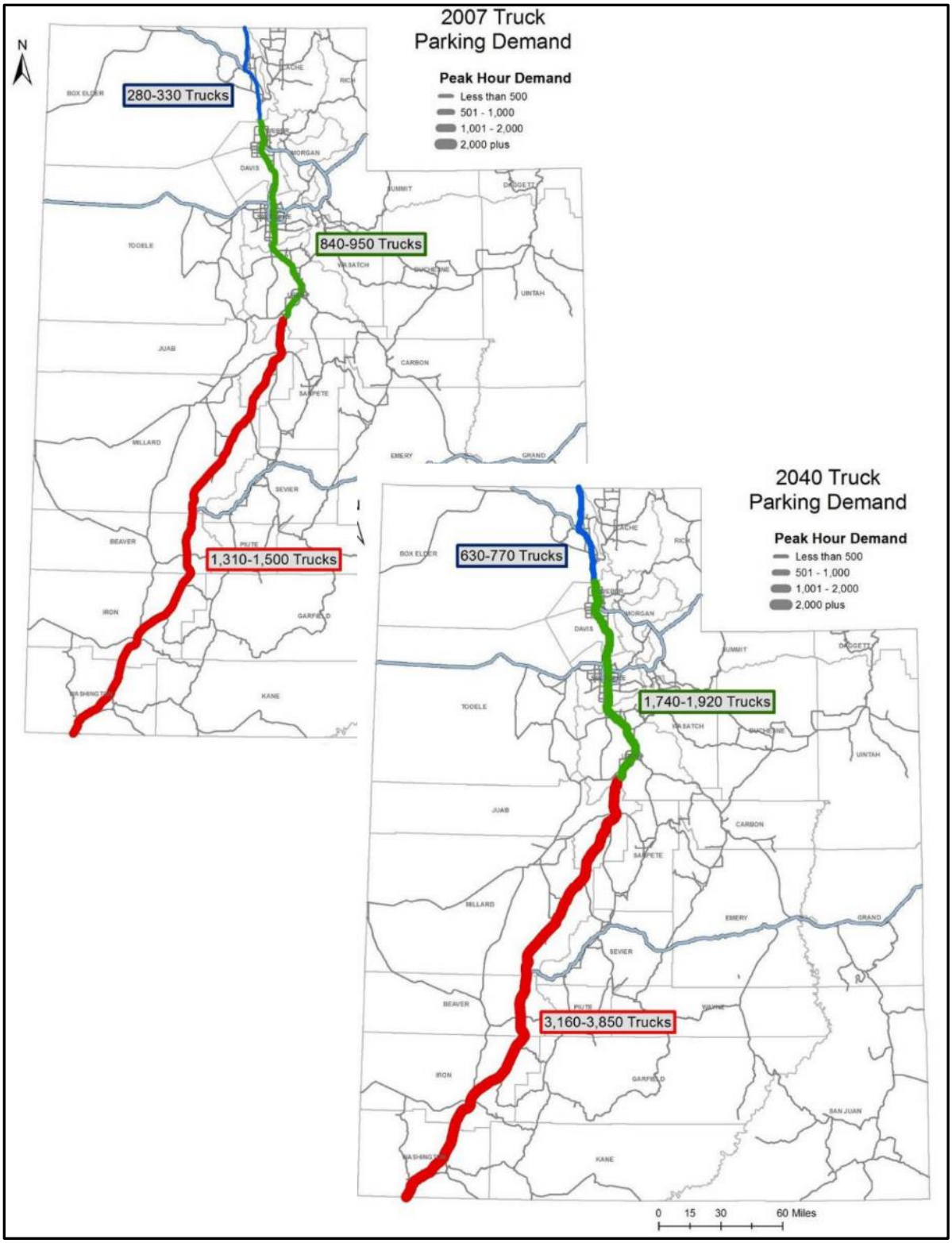
The daily truck-hours of travel on each segment were calculated from traffic volumes, segment length, and average speed (75mph for rural areas and 65mph for urban areas). Then, the truck-hours of parking demand per day were calculated using the daily truck-hours of travel estimates and national ratios showing the average amount of time that trucks spend parked relative to moving. These ratios differ between the short-haul and long-haul traffic. For long-haul traffic, this ratio is 49 hours of parking time to 70 hours of driving. For short breaks, the assumption was a stop of five minutes per hour of driving. The demand for truck-hours of parking was calibrated using peak hour factors and seasonal factors. The net peak season, peak hour truck parking demand was then calculated (shown in **Figure 11**).

Figure 10: Long-haul truck Traffic (2007 and 2040) on I-15



Source: Utah I-15 Truck Parking Study

Figure 11: Peak Season, Peak-hour Truck Parking Demand in 2007 and 2040



Source: Utah I-15 Truck Parking Study

2.3.3 Recommendations

Based on the results of the survey and the demand analysis, the report makes the following recommendations that have either already been implemented or are being investigated for implementation:

- Develop a visor card or truck parking map that indicates the locations of commercial truck stops and public rest stops along the National Highway System in Utah. This map, developed in 2012, also includes relevant information, such as telephone numbers, how many long-term parking spaces are available, and amenities offered.
- Enhance an existing smartphone application that informs motorists of road conditions to include the locations of commercial truck stops and public rest areas.
- Develop an interactive map and make available on the UDOT website that allows truck drivers to locate truck parking facilities in the state.
- Organize a Highway Rest Facility Committee (HRFC) to oversee the development and implementation of a formal Highway Rest Facility System Program (HRFP). This program would promote efforts to increase truck parking at public rest areas along the corridor, by identifying locations where parking is most needed as well as providing cost estimates and identifying potential funding sources.

2.4 WSDOT (2016) Washington State Truck Parking Study

In 2016, the Washington State Department of Transportation (WSDOT) published the Washington State Truck Parking Study.

2.4.1 Inventory

Findings for Private Parking

WSDOT identified 49 private truck stops in Washington with a combined 2,442 parking spaces for trucks. Most of these truck stops are located along major truck routes, such as I-5, I-90 and I-82, although there are no truck stops around the Seattle metro region. Truck stops range in size from just a couple of spaces to over 200 spaces.

The study noted the presence of private retail locations, such as Wal-Mart or Home Depot, that allow truck parking in their parking lots, especially after hours. Many truck drivers park in these locations as they are well-lit, easy to find, and are close to food outlets and restrooms.

The study also considered truck parking facilities in vacant or abandoned lots on privately owned land, which arise in response to the deficit of truck parking spaces. However, it is difficult to gauge the exact supply and demand for these spaces as most are not documented. Further, these stops typically lack the basic amenities desired by truckers.

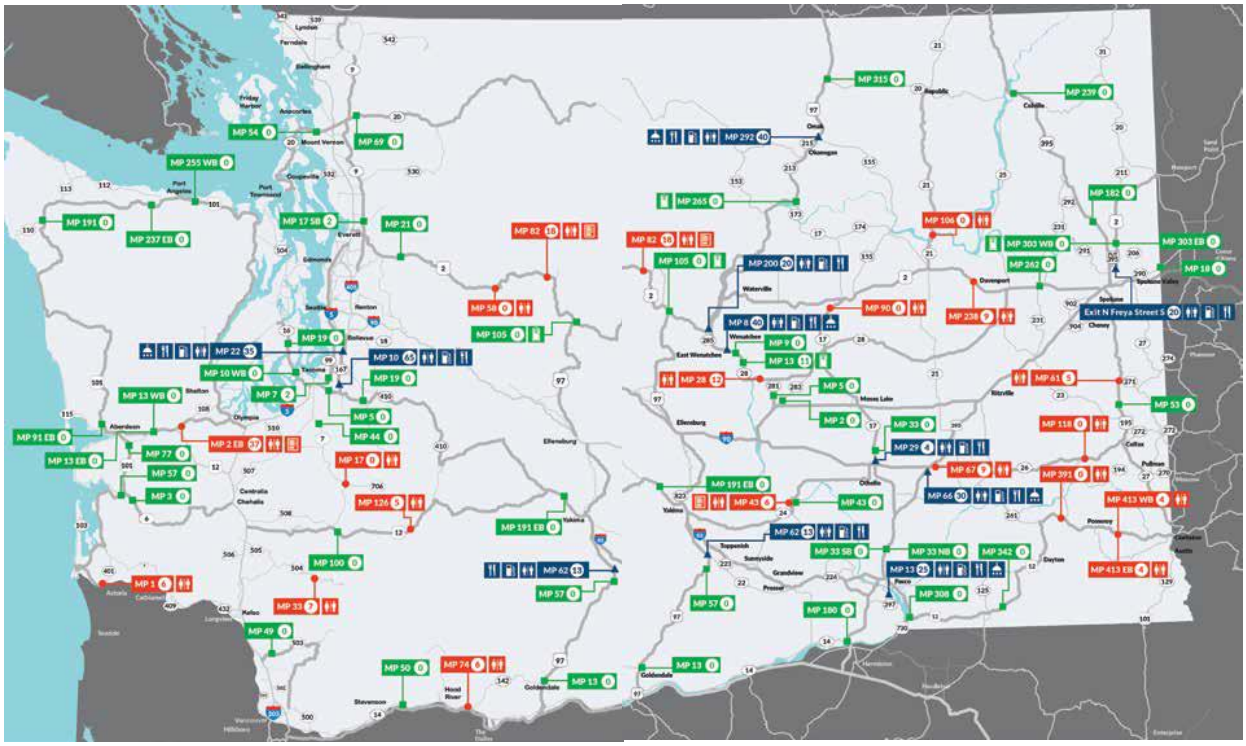
Findings for Public Parking Spots

WSDOT owns and operates 47 rest areas in Washington, with over 500 truck parking stalls. These rest areas are located 35 to 40 miles apart in accordance with FHWA recommendations. Weigh station locations owned by WSDOT are also commonly used for undesignated truck parking and consequently WSDOT regional offices have reported littering at some of these sites.

WSDOT owned right of way (ROW), including highway shoulders, exit ramps, mountain chain-up areas, and passing zones, are also unofficial truck parking locations, as it is easy for trucks to identify vacancies. Land owned by cities, counties, and ports may also be designated for truck parking facilities. Some municipalities, however, severely restrict truck parking. Seattle limits commercial vehicles to a loading time of 30 minutes and bans vehicles over 80 inches in width from parking on city streets between midnight and 6am.

Ports also experience truck parking issues in surrounding areas from short-term and longer-term parking or truck storage. Truck drivers may require temporary staging locations while waiting for port gates to open. Longer-term parking is required to satisfy HOS requirements or for truck storage. Truck parking options are often limited near port facilities, forcing truck drivers to park on the streets in industrial areas or even in residential neighborhoods. Washington's truck parking inventory is shown in **Figure 12**.

Figure 12: Truck Parking Locations in Washington



Source: WSDOT Truck Parking Study

2.4.2 Survey and Outreach

WSDOT engaged truck drivers in an online survey, as well as other industry stakeholders in roundtable discussions. The survey received 1,118 responses, 84 percent of which were from truck drivers. The main findings of the survey were:

- Private truck stops are the number one preference for both short-term and overnight parking (32 and 36 percent of respondents, respectively).
- Short-term and overnight parking is generally difficult to find, with 60 percent of respondents taking one-hour or longer to find overnight parking.

- Truck parking shortages increase safety and legal risks, such as driving while fatigued or outside allowed HOS.
- The interstate highways (I-5, I-405, I-82, and I-90) have the greatest truck parking shortage.

Among others, the main issues identified in the survey were:

- **Driver safety**, with 59 percent of respondents expressing concern over finding safe parking at night.
- **Highway safety**, with trucks parked in unofficial locations such as exit and entrance ramps, chain up/down areas on mountain passes, and on roadway shoulders, posing a safety hazard to the public.
- **Mismatch between parking preference and use**. Truck drivers prefer to park in private truck stops, followed by public rest areas. However, many drivers find these parking spots unavailable, leading to parking in undesignated locations. As can be seen in **Table 6**, there is a mismatch between the preferences of drivers and the availability of different facilities.

Table 6: Mismatch between Parking Availability and Preference

Parking Type	Preference	Actual Usage
Private Truck Stop	1	1
Public Rest Area	2	2
Shipper/Receiver Location	3	7
Abandoned Lot	4	5
Weigh Station	6	8
Roadside	7	4
Temporary Parking Lot (e.g., Walmart, casino	8	6
Highway on-ramp/off-ramp	9	3

Source: WSDOT survey

2.4.3 Recommendations

Based on the outreach and engagement efforts highlighted above, WSDOT identified locations of high truck parking interest, as well as technologies to meet the demand for truck parking. These could include using intelligent transportation systems (ITS) solutions such as real-time parking availability information to better match supply and demand of parking spots, using FHWA's Freight Advanced Traveler Information System (FRATIS) and private mobile device apps that provide parking information to truckers.

In particular, the Freight-Specific Dynamic Travel Planning and Performance application of FRATIS includes travel information, dynamic routing and performance monitoring elements that would be useful in reducing street wait times, travel times, and turn-around times at terminals. The wait time data provided to drivers may assist them to better plan their parking locations in advance of the trip. These features are available in commercial software used by truck lines; FRATIS offers a public-source alternative for operators who have not acquired other systems.

2.5 NCDOT (2017) North Carolina Statewide Multimodal Freight Plan: Truck Parking Study

This 2017 study analyzes the adequacy of truck parking resources in North Carolina.

2.5.1 Survey and Outreach

Overall, the outreach efforts of this study were similar to the efforts of parking studies in Virginia and other states. Multiple private and public sector stakeholders were contacted or surveyed as part of the data collection process. A project steering committee consisting of representatives from the NCDOT, North Carolina Trucking Association (NCTA), North Carolina State Highway Patrol, and North Carolina Department of Commerce were surveyed. In-person and telephone interviews were conducted with private parking facility managers, State Highway Patrol officers, and North Carolina DOT Division Engineers.

An online truck driver survey was also conducted. The survey was developed and administered by ATRI, who distributed the final survey online to carriers operating in North Carolina through the NCTA and trucking associations in surrounding states. In addition, OOIDA distributed the survey directly to drivers on behalf of ATRI.

Almost 87 percent of respondents indicated that it took over 30 minutes on average to find truck parking, for both public and private parking facilities. Shipper unwillingness to provide truck parking also increased demand for off-site parking. The study notes that truck driver compensation models often do not reimburse drivers for non-revenue miles accrued while searching for parking. If the time required to secure truck parking reduces the revenue-earning miles for a driver, drivers will be impacted negatively.

The HOS 10-hour rest break and 30-minute rest break ranked number one and two, respectively, as the top reasons drivers require truck parking. Other reasons included parking while awaiting dispatch, and parking to access restrooms or food establishments. Private truck stops were the most-utilized facility type by drivers, followed by public rest areas and shipper/receiver locations (see **Table 7**).

Table 7: Rest Stop Type and Frequency of Usage

Metric	Public Rest Area	Private Truck Stop	Shipper/Receiver	Ramp/Road Shoulder	Other
Average	27.7%	46.0%	21.1%	15.4%	17.4%
Median	20.0%	40.0%	20.0%	10.0%	10.0%

Source: ATRI

2.5.2 Additional Findings

Besides corridor-specific solutions, this study recommended the following strategies to ensure adequate and safe truck parking spaces:

- Partner with private truck travel centers to expand parking facilities and coordinate signage, since improved parking information was found to be important to drivers.
- Develop and employ communication and signage systems to provide information on truck facility locations and parking availability to drivers so that they can plan rest periods ahead of time or while in-transit. Detection systems to monitor the safety of truck parking spaces were also recommended.
- Explore the possibility of piloting truck parking at weigh stations. The advantages of this option would be the relatively low cost of implementation to provide some additional truck parking spaces. Disadvantages include disrupting weigh station activities with entering and exiting trucks, increased maintenance, and potential confusion over where trucks should park.

- Referencing efforts in Virginia, Kansas, Wisconsin and Florida, the study recommends developing a truck parking notifications pilot system that estimates truck parking availability based on demand at participating truck parking facilities.
- Coordinate with Metropolitan Planning Organizations and Rural Planning Organizations to develop guidelines and mitigation strategies aimed at easing public opposition to private truck parking facilities.
- Create a Truck Parking standing subcommittee within the DOT to assist the implementation of the corridor-specific and regional study recommendations.

2.6 KDOT (2016) Kansas Statewide Freight Network Truck Parking Plan

The objective of this 2016 study was to improve the freight network's safety, efficiency, and competitiveness, especially along main freight corridors in the state, such as I-70 and the Kansas Turnpike.

2.3.1 Demand and Supply Analysis

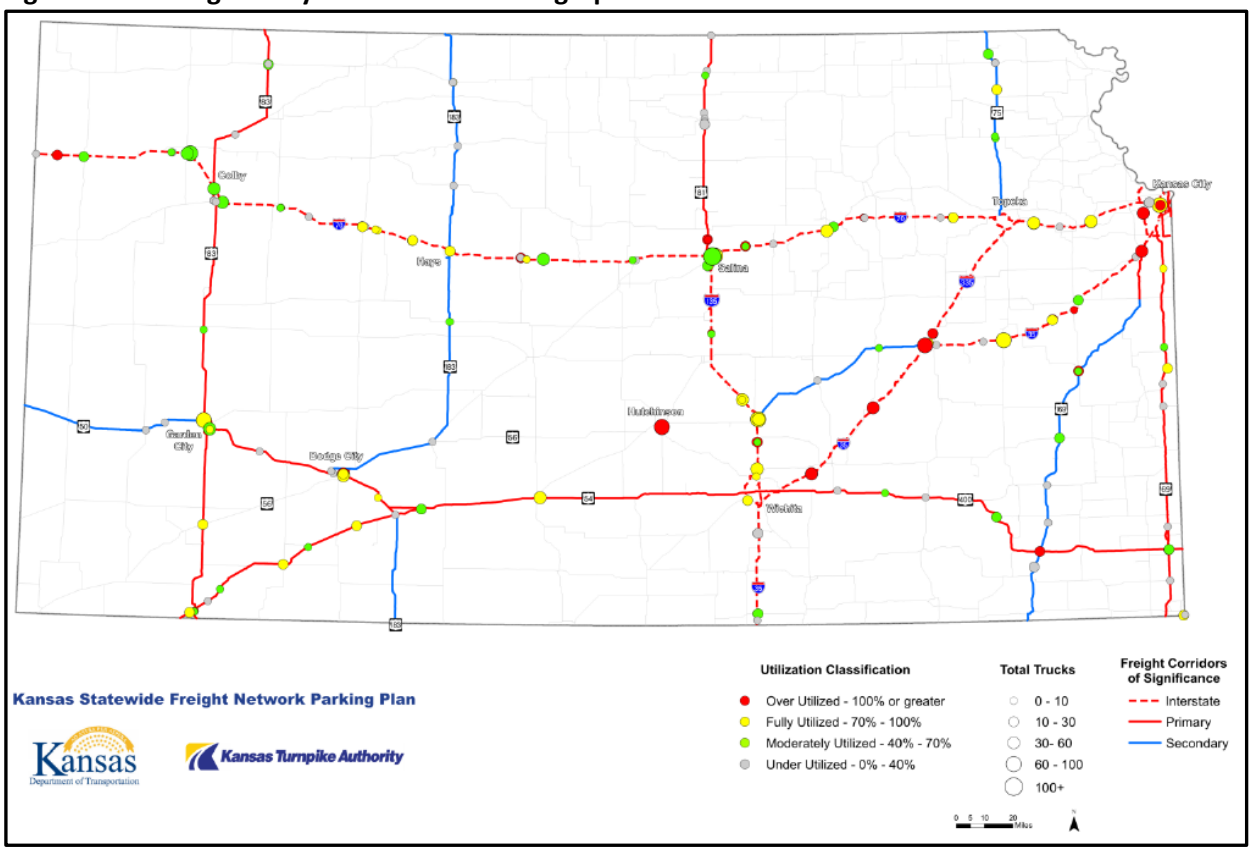
After conducting a review of previous national studies, KDOT performed a statewide inventory of truck parking facilities and characterized their usage patterns. This was completed in two steps:

- Aerial imagery from Google Earth was used to identify truck parking facilities on major freight corridors, from which a count of parking spaces was established. A geographic database of designated parking spaces was created during this review to guide the field teams in the following step.
- Field review teams drove to the truck parking facilities in the database to collect data on parking utilization, type of facility (rest area, service area, commuter lot, truck stop, etc.), condition of the facility, amenities offered, and whether it was public or private. The field teams found that in many cases truck parking facilities were fully utilized, with undesignated truck parking occurring nearby.

The parking database was enhanced with the data collected from the field review and then mapped to illustrate locations with high utilization rates (shown in

Figure 13).

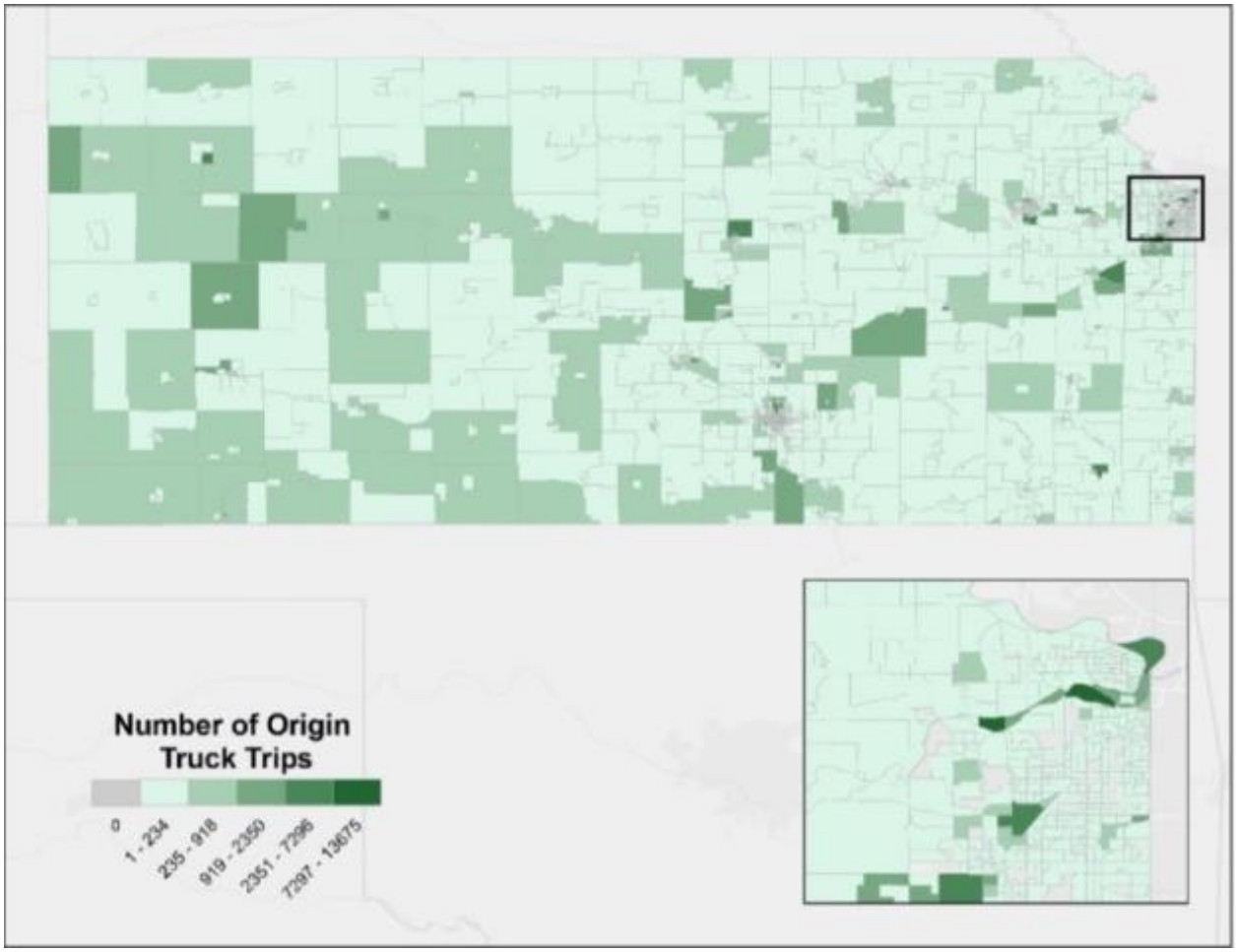
Figure 13: Parking Facility Utilization and Geographic Concentration



Source: Kansas Statewide Freight Network Parking Plan

This truck parking inventory was supplemented with a study of GPS data from trucks to determine when and where drivers are parking overnight and for their mandated 30-minute breaks. This GPS data was collected by ATRI for four two-week periods over the course of a year. The data collected was mapped (shown in **Figure 14**) to analyze geographic trends and corroborate other findings (such as the ease in finding parking in rural areas relative to urban areas).

Figure 14: Freight Network Census Block by Origin Trip Volumes



Source: Kansas Statewide Freight Network Parking Plan

2.3.2 Survey and Outreach

An electronic survey was prepared and distributed by ATRI to truckers operating in and through Kansas. About 750 surveys were completed. The key findings were:

- 83 percent of respondents cited HOS as the main factor in their decision to park.
- 78 percent required up to one hour or more to find adequate parking
- 52 percent found it equally difficult to find parking in public or private rest stops
- 48 percent were most likely to find parking in rural areas versus only 25 percent in metropolitan areas.

Further, interviews were conducted with MAASTO and the Mid-America Freight Coalition (MAFC), as well as peer organizations such as DOTs in Iowa, Minnesota, Missouri, Colorado and Wisconsin, to gain insights on best practices for evaluating the benefits of truck parking improvements, and factors affecting parking decisions.

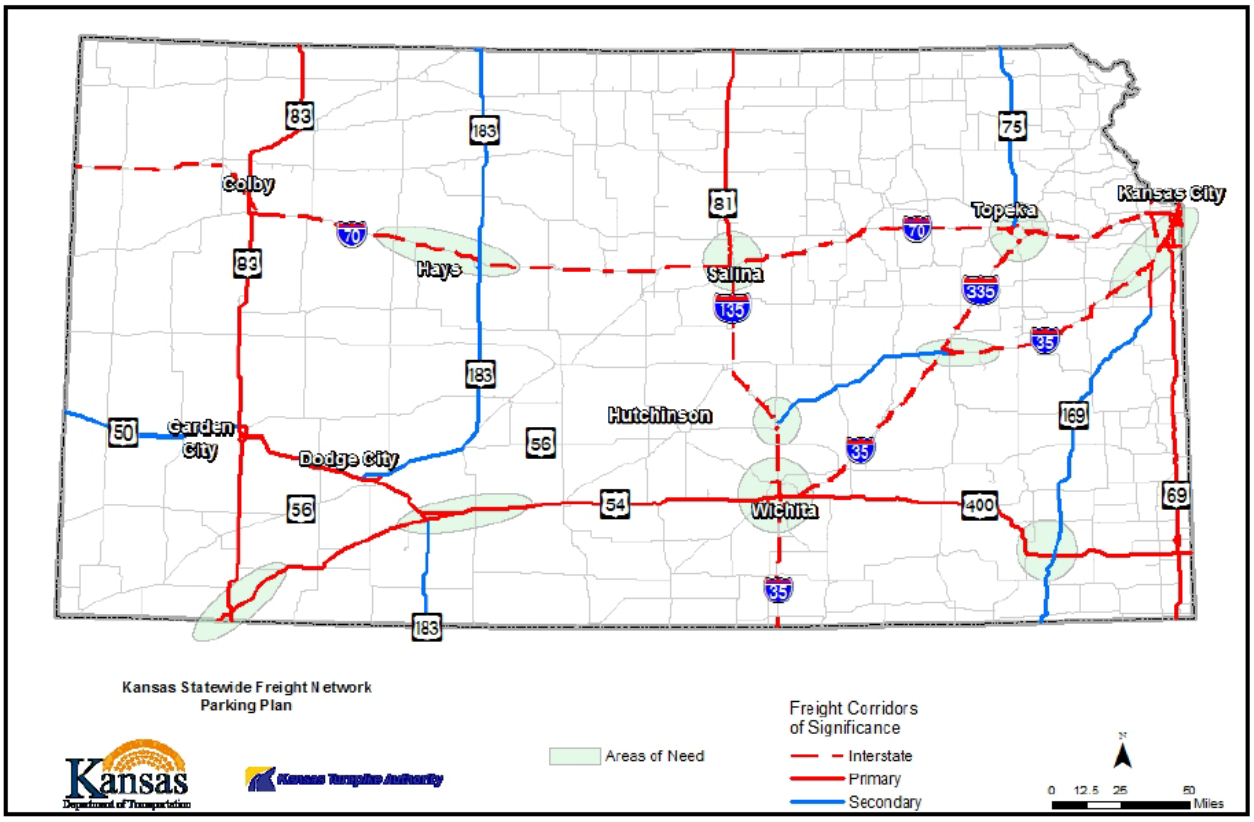
According to the study, peer DOTs also experienced difficulties from truck parking demand exceeding supply at some locations that are near urban areas. The interview with the MAFC further stressed the need for truckers to

have real-time information on truck parking availability and amenities offered to allow them to plan their trips. Many of the interviews mentioned the need to leverage public-private partnerships to enhance truck parking supply in major freight corridors. To address these problems, DOTs have added parking capacity and have started using technology to provide parking availability information to truckers.

2.3.3 Recommendations

Based on the field work and outreach efforts, KDOT developed a map of potential opportunity locations for truck parking improvements (shown in **Figure 15**)

Figure 15: Opportunity Zones for Truck Parking Improvements



Source: Kansas Statewide Freight Network Parking Plan

The general recommendations of this study were:

- Developing new (or improving existing) public and private truck parking facilities where the need is greatest.
- Overcoming barriers to using existing designated parking facilities in urban and rural areas.
- Identifying information and technology services to help truckers make better parking decisions.
- Creating partnerships with public- and private-sector entities to improve parking facilities and amenities.
- Use excess right of way for parking and improve geometrics where applicable for better parking.
- Investigate benefits of creating multistate, regional truck parking policies, as well as integrated local parking policies and pro-freight truck tax policies.

3. Regional and Local Truck Parking Research

3.1 MAASTO Regional Truck Parking Information Management System (2016 – ongoing)

In 2016, an 8-state coalition within the Midwest division of AASHTO received a $25 million Federal TIGER grant to develop a regional truck parking information system (TPIMS). The primary objective of the TPIMS is to reduce time searching for parking and to provide safe truck parking alternatives in the states of Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Ohio and Wisconsin. The program was developed in response to the critical need for truck parking in the region. The lead state for the TPIMS project is Kansas DOT.

TPIMS are intended to convey real-time information to truck drivers about available parking, thereby maximizing utilization of existing truck parking capacity. Two main approaches are considered to determine parking space availability:

- Sensing a vehicle parked in an assigned location using in-ground sensors or camera systems.
- Counting vehicles as they come in and as they leave a facility, using closed-circuit television, infrared sensors, above-ground radar, and side laser scanners, among others.

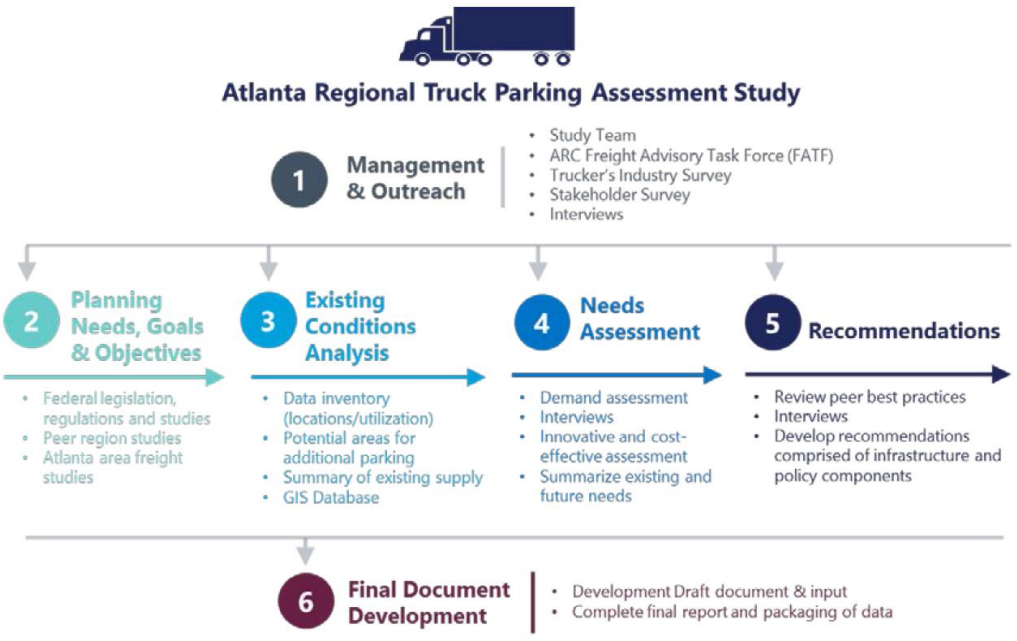
The state systems differ somewhat in design, technologies and management approaches, but will all monitor truck parking availability and provide real-time information to truck drivers via a combination of apps, websites and dynamic message signs (DMS).

3.2 ARC (2018) Atlanta Regional Truck Parking Assessment Study

The Atlanta Regional Commission (ARC) published in 2018 the “Atlanta Regional Truck Parking Assessment Study”. This study had the components described in

Figure 16.

Figure 16: Atlanta Regional Truck Parking Assessment Study Tasks



Source: Atlanta Regional Truck Parking Assessment Study

3.2.1 Survey and Outreach

An online survey was administered to local jurisdictions/community improvement districts, law enforcement officers, truck stop/convenience store owners or operators, and trucking companies/shippers.

- Almost half of the responses came from local jurisdictions and community improvement districts (37 responses).
    - Of these, 22 percent indicated that they do take an active role in truck parking issues, mostly indicating that trucks cause substantial disruptions to regular traffic and sometimes even damage roadway infrastructure, like streetlights.
    - Other issues mentioned included: truck parking in large parking lots, residential parking, and road shoulders.
    - Zoning was the favored policy to address truck parking, and enforcement and communication were the preferred strategies to deal with specific parking issues.
- Law enforcement responses to the survey focused on the use of warnings, citations, and vehicle impounding.
- Responses from trucking companies/shippers indicated that:
    - 73 percent thought that truck parking was a serious issue, with a majority explaining in detail how limitations in truck parking availability affect their operations.
    - Almost half also indicated that HOS regulations had a negative impact on their operations.
    - Ninety-five percent of respondents indicated that they expected truck parking demand to increase over the coming decade.
    - Thirty two percent of respondents indicated that dispatchers assist the truck to find parking.
    - Roughly half of the respondents indicated that truck drivers were the ones responsible for paying for parking, with 1/3 of these respondents indicating that they do not receive reimbursement from the trucking company.

A survey was conducted of truck drivers with the assistance of ATRI, OOIDA, and the trucking associations of neighboring states. The survey contained questions about the background of the truck drivers and the parking challenges within the Atlanta region. This survey received 277 responses.

Respondents rated the most important amenities at truck stops to be:

- Restrooms
- Adequate security
- Access to the interstate
- Showers
- Fueling services

Over half indicated that it takes them on average over 1 hour to find parking. The methods most commonly used to find parking were:

- Continue driving until a safe location is found (69 percent)
- Smartphone applications (55 percent)
- Being aware of destination in advance (47 percent)

Truck drivers were also asked to rate the availability of parking along certain highway segments in the Atlanta region.

The stakeholder outreach also included interviews of truck drivers, carriers, truck owners, and enforcement officers. The findings of these interviews are described in detail in the study but in general, they simply provide additional explanation for the issues raised.

3.2.2 Supply and Demand Analysis

An inventory of truck parking facilities in the region was obtained by mining data from various sources, including:

- Federal Highway Administration
- Georgia Department of Transportation
- Georgia Environmental Protection Division
- Website and smartphone applications (Trucker's Friend, National Truck Stop Directory, and NATSO's Park My Truck)

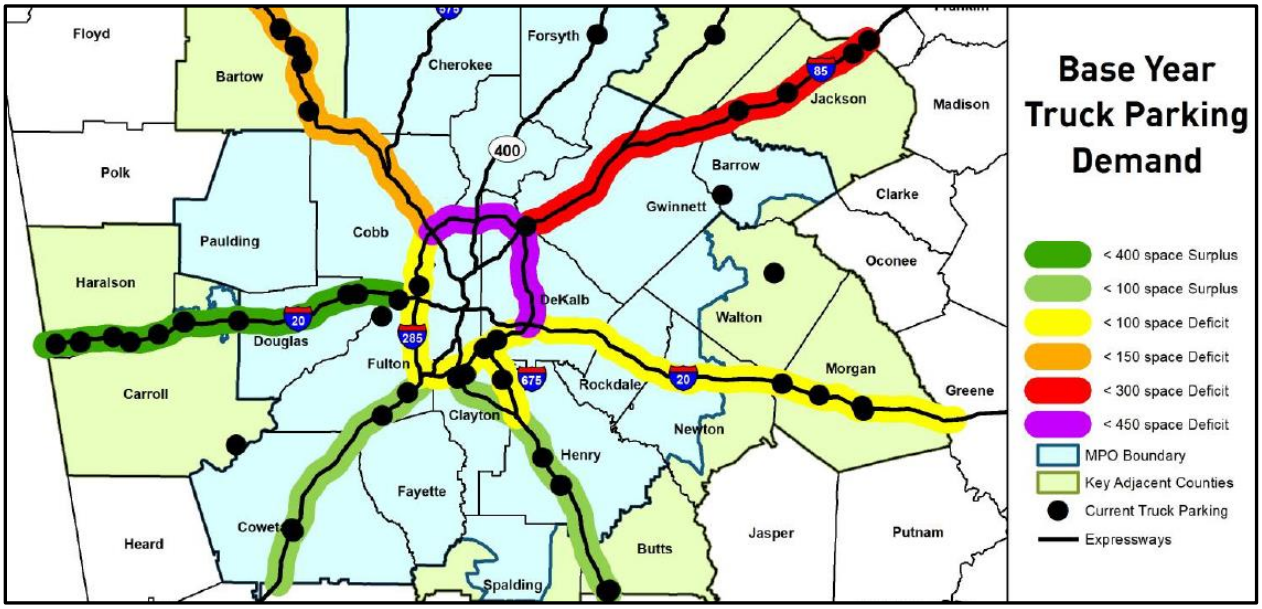
The inventory included information on facility name, location (geocoded), number of spaces, amenities, and data source.

To identify private or undesignated parking, the study relied on GPS data from ATRI to manually identify locations where truck stops cluster.

The demand for truck parking along interstates was calculated using a model published by the FHWA in 2002. A key input of this model is freight volume information, which this study obtained from the Freight Analysis Framework database, for current and future conditions. This might represent a limitation of this study as the volumes in this database are sometimes substantially different than the volumes observed on the ground, because the database values result from several national modeling efforts that cannot replicate conditions precisely throughout the country, particularly in complex urban areas such as Atlanta. Parking demand estimates were compared to the supply of public and private spaces found in the inventory to estimate the deficit or surplus of truck parking spaces. The results were mapped as shown in **Figure 17**.

Parking utilization was also quantified using truck GPS data from ATRI. This analysis compared the number of truck stopping locations longer than 2 hours on the corridor between 12 a.m. and 4 a.m., to the availability of parking spaces. The GPS routes from ATRI were then used to show how trucks that pass through a specific polygon, for example at a milepost in I-74, are routed through the regional network.

Figure 17: Parking Surplus or Deficit



Source: Atlanta Regional Truck Parking Assessment Study

3.2.3 Recommendations

The following lists the strategies recommended to address truck parking issues within the Atlanta region:

- Add / Expand Truck Parking Supply
- Develop Truck parking policies that:
  - Allow for sharing of costs and benefits
  - Incentivize shifting freight operations to off-peak hours
  - Develop truck parking model zoning language and encourage local agencies to review zoning ordinances
- Improve sharing of truck parking availability through real-time truck parking availability systems
- Monitor and integrate future technology developments in the freight industry such as connected/autonomous vehicles, Internet of Things and dock management technology

3.3 NCTCOG (2018) Truck Parking Study: A Freight North Texas Study

3.3.1 Supply and Demand Analysis

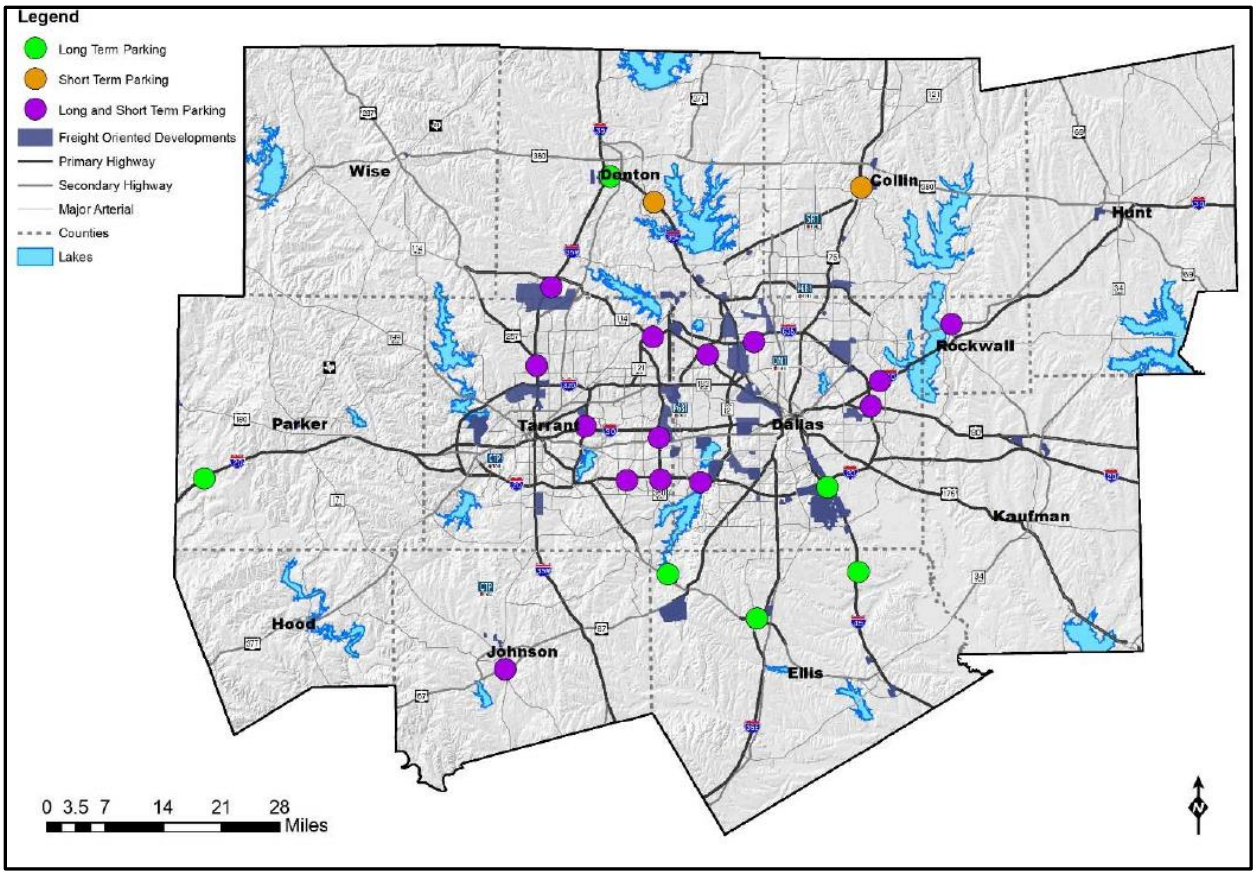
Supply Inventory

In addition to reviewing data from prior truck parking studies in Texas and elsewhere, this study gathered information on all truck stop facilities and Texas Department of Transportation (TxDOT) sponsored rest areas, including their location, total truck-parking lanes available, amenities offered, overnight parking availability, and any relevant technology installed. An illustration of the location of existing parking facilities is presented in **Figure 18**.

Demand

On the demand side, the study reviewed the most heavily traveled freight corridors to identify the average truck volume on these highways, as well as travel time data from across the region. This was done to determine how long it takes to travel across a given corridor, the effect of a drivers' HOS, and the travel time to and from Freight Oriented Developments (FODs), and major freight facilities. Local truck parking ordinances were also reviewed to identify corridors that lack adequate parking due to restrictions on commercial vehicles. This analysis was performed corridor by corridor; however, because of the lack of availability of data on parking demand, it is difficult to ascertain the accuracy of the results.

Figure 18: Location of North Texas Parking Facilities



Source: Truck Parking Study: A Freight North Texas Study

3.3.2 Survey and Outreach

A driver survey was conducted where different groups of motor carriers were surveyed to obtain their observations regarding truck parking availability and the amenities and characteristics that are valuable to drivers. NCTCOG staff distributed the survey at The Great American Truck Show to drivers that frequent the North Central Texas region and are familiar with truck parking facilities in the region. The survey was also available online (the number of responses was not shown).

For both short-term and long-term truck parking stops, drivers graded safety, convenience and cost as the highest priority factors. For long-term stops, security, food, showers and electrification were found to be the most important amenities. For short-term stops, highly valued amenities included food choices, restrooms and shopping choices.

In addition to the survey, other forms of stakeholder outreach were conducted. Fleet managers were engaged to determine specific areas of concern for short-and long-term parking. Site visits to truck stops were conducted to identify availability of parking and amenities at specific locations. The study was also discussed at the Regional Freight Advisory Committee public meetings to gather stakeholder input and to help determine specific corridors of concern.

3.3.3 Recommendations

This study leaned on corridor-specific solutions and similar truck parking studies around the country to provide recommendations for truck parking concerns. The study recommended strategies such as:

- Unused right-of-way owned by TxDOT, including weigh stations and closed rest areas, may be a short-term option for truck parking capacity.
- Requiring on-site parking at freight-oriented developments (FODs) and freight facilities such as distribution centers and warehouses would reduce the need for short-term truck parking. This would include parking facilities specifically set aside for drivers who arrive too early or who are mandated to take a break due to their hours of service.
- The study identified the need for a review of land use and zoning study around FODs and freight-focused areas. It was noted that residential lots that are often near or mixed with these freight facilities are not compatible with providing adequate truck parking spaces at these terminals.
- Funding agreements between the state and local/regional public agencies could be arranged for facility construction, maintenance, and operation of public rest areas.
- The public and private sectors could collaborate to develop more truck parking along with the development of incentives that mutually benefit the two parties. This could include roadway improvements, entrance/exit upgrades, competitive leasing, special zoning districts, intelligent parking availability notification (advanced signage), electrified parking, security measures, and other driver amenities.
- Technologies may be implemented to promote a more cohesive relationship between actual truck parking availability or projected availability, notification of availability, and amenities specific to individual facilities.

3.4 Greater Memphis Regional Freight Plan (2017)

While the Memphis MPO that developed the Greater Memphis Regional Freight Plan did not undertake a full-scale truck parking plan, they devoted one section of the freight plan to discussing truck parking.

As part of the data collection phase of their freight plan, the Memphis MPO conducted a survey of logistics operators in the region. Truck parking was identified by drivers as the number one challenge, with 82% picking lack of availability as the top challenge. As such, the MPO identified the following potential solutions in the freight plan:

- Constructing new public rest areas and/or Increasing spaces at existing public rest areas
- Engaging private truck stop owners to expand capacity
- Improving parking information communication with intelligent transportation systems (ITS)

4. Best Practices Conclusion

A breakdown of recommendations from the federal, state and regional truck parking plans reviewed is presented in **Table 8**. These recommendations fall into six categories summarized below:

1. Data and Technology Deployment
    - Primarily utilized to provide real-time communication to truckers on availability and location of truck stops and rest areas.
    - Includes sensing technologies such as in-pavement sensors, entry-exit gates, camera systems to determine utilization and availability of parking spaces and communication media such as dynamic message signs, smartphone and web apps and in-cab navigation to disseminate the information to truckers in real time.
    - For a lower cost solution, some states also recommend installing static truck parking signage on highways and distributing visor card trucking maps to truckers at trucking conferences and other meets.
2. Public Truck Parking capacity expansion
    - Primarily focused on expanding truck parking spaces on interstate or other roads with high parking needs.
    - Supply/demand analyses can be completed on major routes across the region to determine locations of high-demand and/or low supply of truck parking spaces.
    - GIS analyses may be completed on urban land parcels to determine viability of conversion into truck parking areas.
    - Creative use of publicly-owned excess ROW at existing parking lots, weigh stations, service areas and other locations on interstates, as well as improving geometrics at existing locations are also recommended.
3. Capacity expansion through public-private partnerships
    - Where ROW for capacity expansion is lacking, partnering with private businesses and truck stops to expand parking facilities and coordinate signage is recommended, since improved parking spaces and information was found to be important to drivers.
    - Where public funding is insufficient, cost-sharing agreements for construction and maintenance of parking areas with private partner may be useful. Private partners may also be allowed to set up stalls at such facilities to provide revenue incentives for engaging truck parking expansion.
    - Partnering with businesses that are served by freight to explore warehouse and distribution center parking may provide an opportunity to coordinate on staging requirements as well as expanding short-term truck parking spaces required by drivers.

4. Policy and Regulations
    - Modify Truck Parking Ordinances to include short-term truck parking staging requirements
    - Utilize zoning laws to help locate freight facilities closer to more efficient truck routes and/or require industrial/warehousing uses to build staging truck parking
5. Coalitions and Institutional Oversight
    - Designate truck parking champions and/or establish truck parking committees within the agency to champion truck parking goals and oversee implementation of truck parking plans and objectives.
    - A cohesive regional multi-state truck parking plan with a goal to matching supply and demand, increase roadway safety and policy conformity reduces the time required by drivers to find safe parking spaces.
6. Public and Private Strategies
    - One of the main impediments to expanding truck parking is public opposition to private truck parking. Coordinate with local planning agencies to develop guidelines and mitigation strategies aimed at easing such public opposition.

Table 8: Compiled Recommendations to Advance Truck Parking Solutions from Reviewed Truck Parking Plans

Strategy type	Recommendation	Goal	Status/Notes[1]	State	Year of Study
Data and Technology Deployment	TPIMS Implementation	Improve communication of location and availability of truck parking spaces	Sensing technology (sensors, cameras, entry-exit gates) and real-time communication (DMS, smartphone apps, in-cab nav. And traveler 5-1-1 websites) implementation and launched in project member states in Jan 2019. (KS, KY, IN, IA, MN, WI, OH, MI) Example, in MN camera systems have been installed at six rest areas, DMS displayed on I-35 and I-94, system live in Jan 2019. General early feedback from truckers is positive. Cost $12 million. Member states provide parking availability data feeds online at truckparkhere.com. Several private mobile apps and websites (eg. Tsps.io, Mile On, TruckMap, Trucker Tools, American Truck Parking, etc.) utilize or will utilize these feeds to provide smartphone and web apps for truckers with real-time information ATRI undertook a driver survey in Nov/Dec 2019 to gather feedback on TPIMS benefits and implementation. Report not public yet.	MAASTO	2016

[1] Status is based on limited internet searches and is not comprehensive.

Strategy type	Recommendation	Goal	Status/Notes[1]	State	Year of Study
Data and Technology Deployment	TPIMS proof-of-concept and pilot at various locations	Improve communication of location and availability of truck parking spaces	Goal to improve communication of rest area locations and availability to drivers. Currently in Phase 1 looking to develop a proof-of-concept to assess pros/cons of various technologies used to implement TPIMS	Arizona	2019
	In-pavement systems, video systems, and light laser detection systems to estimate truck parking availability in a given truck parking or rest area	Increase utilization at existing truck parking spaces Improve communication about location and availability of truck parking spaces	Goal to improve communication of truck parking availability at rest areas or truck stops.	North Carolina	2017
	Utilize dynamic message signs to communicate availability of truck parking at weigh stations	Improve communication of location and availability of truck parking spaces	Goal to improve communication of truck parking availability at rest areas or truck stops.	North Carolina	2017
	GIS Analysis of vacant parcels on land in urban areas for conversion into truck parking areas	Capacity expansion		MAASTO	2017

1

Strategy type	Recommendation	Goal	Status/Notes[1]	State	Year of Study
Data and Technology Deployment	Improve Parking Information and Sharing via static signage and/or TPIMS tool	Improve communication of location and availability of truck parking spaces		Kansas	2016
	Real-time parking availability communication utilizing dynamic message signs, websites, smartphone apps etc.	Improve communication of location and availability of truck parking spaces		Washington	2016
	Real-time parking availability estimates using count-in/count-out technologies, light and laser systems, wireless magnetometers etc.	Increase utilization at existing truck parking spaces Improve communication about location and availability of truck parking spaces		Washington	2016
	Utilize Freight Advanced Traveler Information System (FRATIS) to communicate truck parking availability	Improve communication of location and availability of truck parking spaces	Can also utilize FRATIS to optimize truck parking demand by spreading out truck arrivals at intermodal terminal throughout the day	Washington	2016

[1] Status is based on limited internet searches and is not comprehensive.

Strategy type	Recommendation	Goal	Status/Notes[1]	State	Year of Study
Data and Technology Deployment	Investigate idle reduction technologies such as auxiliary power units (APUs) and truck electrified parking (TEP). I-5 has been nominated as a National Alternative Fuel Corridor	Improve environmental sustainability of truck parking stops and rest areas		Washington	2016
	Increased static signage along freeways and highways	Improve communication of location and availability of truck parking spaces	N/A	Utah	2012
	UDOT Traffic Operations Center smartphone application indicating long-term parking locations and availability of truck stops at those locations	Improve communication of location and availability of truck parking spaces	Does not seem to be included in UDOT smartphone app. Interactive truck parking/rest area maps available on website, as well as printable version. Truck parking does not appear to be included in UDOT smartphone app.	Utah	2012
	Visor card indicating long-term parking locations	Improve communication of location and availability of truck parking spaces	10,000 maps printed and distributed at trucking conferences and conventions. Available on website. Did not find studies on effectiveness such as follow-on trucker surveys.	Utah	2012
	Examine causes and locations of truck crashes and determine the extent to which truck parking could mitigate the issue	Improve roadway safety		North Carolina	2017

[1] Status is based on limited internet searches and is not comprehensive.

Strategy type	Recommendation	Goal	Status/Notes[1]	State	Year of Study
Data and Technology Deployment	Develop inventory of truck parking assets, analyze demand for truck parking along important corridors within state, identify corridors where truck parking demand exceeds supply	Capacity expansion Increase utilization of parking spaces		Virginia, Florida, Minnesota, Washington	Various
	Interstate Oasis Program with nearby truck stops	Goal to increase safety and adequacy of existing truck stops		Arizona	2019
	Expansion of rest areas at various locations	Capacity expansion	Goal to increase overall system capacity of truck parking spaces. Currently in Phase 1 looking to allocate funding to various projects.	Arizona	2019
Public Capacity Expansion	Determine feasibility of truck turnouts as truck stops	Capacity expansion via creative use of ROW	Goal to increase low-cost parking capacity where feasible and safe on freeways. Currently in Phase 1 looking to identify safe locations for implementation.	Arizona	2019
	Explore pilot of truck parking at selected weigh stations	Capacity expansion	Focus is on Goal to increase low-cost capacity expansions of truck parking stops. Different states have different policies on legality of truck parking at weigh stations.	North Carolina	2017
	Improved/expanded truck parking areas using excess ROW at parking lots, service areas and other locations on interstates, improved geometrics and capacity expansion	Capacity expansion via creative use of ROW		Kansas	2016

[1] Status is based on limited internet searches and is not comprehensive.

Strategy type	Recommendation	Goal	Status/Notes[1]	State	Year of Study
Public Capacity Expansion	Opening public rest areas that have been closed	Capacity expansion	Public rest areas at the end of their lifespans converted to public-private rest stops. UDOT puts up road signs to advertise these stops, rest areas open 24/7. Agreements with private businesses rewritten over the years to include no pressuring of sales	Utah	2012
	Develop design standards for truck stops and identify alternate truck parking locations such as roadside table tops, brake check areas and safety pullouts	Improve safety and security at parking facilities Capacity expansion via creative use of ROW	Goal to increase capacity as well as safety at truck stops.	Arizona	2019
	Explore warehouse parking, vacant urban land and weigh stations for truck parking and rest areas	Capacity expansion		MAASTO	2017
Expansion via private partnerships	Truck parking supply expansion via P3s and addition of parking supply at safety rest areas and weigh stations	Capacity expansion via public private partnerships		Washington	2016
	Investigate expanding parking via P3s - utilizing excess ROW owned by state near private facilities and entering cost-sharing agreements for construction and maintenance of parking areas.	Capacity expansion via creative use of ROW Capacity expansion via P3s		Kansas	2016

[1] Status is based on limited internet searches and is not comprehensive.

Strategy type	Recommendation	Goal	Status/Notes[1]	State	Year of Study
Expansion via private partnerships	Utilize FMCSA'S Innovative Technology Deployment (ITD) program to fund truck parking improvement/expansion	Funding source/mechanism to implement truck parking projects and studies		North Carolina	2017
Policy and Regulations	Utilize safety rest area funding, TIGER/INFRA/DERA grants to fund truck parking expansion opportunities	Funding source/mechanism to implement truck parking projects and studies		Washington	2016
	Modify Truck Parking Ordinances to include short-term truck parking staging requirements	Policy modification to enable capacity expansion		North Central Texas COG	2018
	Utilize zoning laws to help locate freight facilities closer to more efficient truck routes and/or require industrial/warehousing uses to build staging truck parking	Capacity expansion		Nevada	2019
	Legalize truck parking at weigh stations	Policy modification to enable capacity expansion	Publicly available information suggests truck parking spaces have been considered for construction at the North Bend Point of Entry.	Washington	2016
	Designate a truck parking champion to implement truck parking recommendations	Championing truck parking goals and objectives and oversight of recommendation implementation	The truck parking champion will be the primary leader and point-of-contact for implementing recommendations from the truck parking study. Goal to ensure implementation plan stays on track.	Arizona	2019

[1] Status is based on limited internet searches and is not comprehensive.

Strategy type	Recommendation	Goal	Status/Notes[1]	State	Year of Study
Coalitions and Institutional Oversight	Establishment of Highway Rest Facility Committee to oversee development and implementation of a formal Highway Rest Facility Program	Championing truck parking goals and objectives and oversight of implementation of recommendations		Utah	2012
	Convene a Truck Parking Committee to oversee implementation of truck parking solutions and regulations	Championing truck parking goals and objectives and oversight of implementation of recommendations	Addition of truck parking in urban areas or near communities has been known to face strong public opposition	North Carolina	2017
	Establish competitive loan or grant program to provide funding for public and private truck parking expansion to respond to future changes in demand	Funding source/mechanism to implement truck parking projects and studies		Nevada	2019
	Investigate creation of a Regional Freight Coalition and benefits of regional (multi-state) truck parking policies and regulations, such as those for designated LCV and overweight vehicles.	Develop cohesive regional truck parking plan/inventory with a goal to matching supply and demand, increase roadway safety and reduce the time required to find safe parking spaces	Inconsistency in these regulations affects transportation costs of shippers who may choose to route heavier loads on longer routes through other states and corridors.	Kansas	2016

[1] Status is based on limited internet searches and is not comprehensive.

Strategy type	Recommendation	Goal	Status/Notes[1]	State	Year of Study
Coalitions and Institutional Oversight	Coordinate with MPOs and RPOs to develop guidelines and mitigations strategies aimed at easing public opposition to private sector parking facilities	Public outreach to allay private parking concerns	Goal to increase outreach to agencies	North Carolina	2017
Public and Private Outreach	Promote truck parking partnerships to expand supply of truck parking	Outreach to local agencies and/or private partners to promote capacity expansion via P3s	Goal to assist cities and local govts as well as private entities in truck parking awareness as well as data and guidance on methods to advance opportunities for P3s.	Arizona	2019
	Partner with private truck travel centers seeking to expand truck parking facilities	Outreach to local agencies and/or private partners to promote capacity expansion via P3s	Private sector controls 85% of truck parking supply in state	North Carolina	2017

[1] Status is based on limited internet searches and is not comprehensive.